IBM

IBM WebSphere Business Modeler V6.2: Process Simulation and Analysis

(Course code WB286 / VB286)

Student Notebook

ERC 1.0

Authorized

IBM | **Training**

WebSphere Education

Trademarks

IBM® is a registered trademark of International Business Machines Corporation.

The following are trademarks of International Business Machines Corporation in the United States, or other countries, or both:

AIX®	AS/400®	Balance®
ClearCase®	DB2®	FileNet®
FlowMark®	Lotus®	Notes®
Rational®	Rational Unified Process®	RequisitePro®
RUP®	Storyboard™	WebSphere®
XDE™	400®	

VMware® and the VMware "boxes" logo and design, Virtual SMP and VMotion are registered trademarks or trademarks (the "Marks") of VMware, Inc. in the United States and/or other jurisdictions.

Adobe is either a registered trademark or a trademark of Adobe Systems Incorporated in the United States, and/or other countries.

Intel and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows and Windows Vista are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

March 2009 edition

Contents

Trademarks

The reader should recognize that the following terms, which appear in the content of this training document, are official trademarks of IBM or other companies:

IBM® is a registered trademark of International Business Machines Corporation.

The following are trademarks of International Business Machines Corporation in the United States, or other countries, or both:

AIX®	AS/400®	Balance®
ClearCase®	DB2®	FileNet®
FlowMark®	Lotus®	Notes®
Rational®	Rational Unified Process®	RequisitePro®
RUP®	Storyboard™	WebSphere®
XDE™	400®	

VMware® and the VMware "boxes" logo and design, Virtual SMP and VMotion are registered trademarks or trademarks (the "Marks") of VMware, Inc. in the United States and/or other jurisdictions.

Adobe is either a registered trademark or a trademark of Adobe Systems Incorporated in the United States, and/or other countries.

Intel and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows and Windows Vista are trademarks of Microsoft Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

Course description

IBM WebSphere Business Modeler V6.2: Process Simulation and Analysis

Duration: 2 days

Purpose

This two-day instructor-led course teaches students how to use IBM WebSphere Business Modeler V6.2 to conduct process simulation and analysis, define business measures, and create custom reports.

In this course, students receive training in process simulation and analysis using simulation results, while also experiencing the capabilities of WebSphere Business Modeler's advanced features.

Hands-on lab exercises enable students to setup and run simulation, conduct analysis from simulation results. Students also create custom report, define business measures, and export project from WebSphere Business Modeler.

Audience

This course is designed for:

- Business analysts
- Implementation consultants
- Project managers
- Support engineers
- Sales and marketing professionals
- Customers who need training in process simulation and analysis using WebSphere Business Modeler V6.2

Prerequisites

Before taking this course, student should complete course WB284 or VB284, IBM WebSphere Business Modeler V6.2: Process Mapping and Analysis.

Objectives

After completing this course, you should be able to:

- Set up and run a simulation
- Conduct dynamic analysis
- Identify methods for process improvement
- Create custom queries and reports
- Describe the purpose of business measures
- Export projects from WebSphere Business Modeler

Agenda

Day 1

Course introduction
Unit 1. Review of process mapping and analysis
Unit 2. Introduction to simulation and analysis
Unit 3. Setting up and running simulations
Exercise 3. Simulation and analysis
Unit 4. Profile and dynamic analysis
Exercise 4. Dynamic analysis
Unit 5. Process improvement
Exercise 5. Process improvement

Day 2

Unit 6. Custom reports and queries
Exercise 6. Creating a custom report
Unit 7. Defining business measures
Exercise 7. Defining business measures in WebSphere Business Modeler
Unit 8. Exporting from WebSphere Business Modeler
Exercise 8. Exporting from WebSphere Business Modeler
Unit 9. Course review
Unit 10. Course summary

Unit 1. Review of process mapping and analysis

What this unit is about

This unit describes the Modeler course summary.

What you should be able to do

After completing this unit, you should be able to:

- Explain the key concepts that were covered in the process mapping and analysis course

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
• Explain the key concepts that were covered in the process mapping and analysis course

Figure 1-1. Unit objectives   WB286 / VB2861.0

Notes:

The process drives development through the use of business services
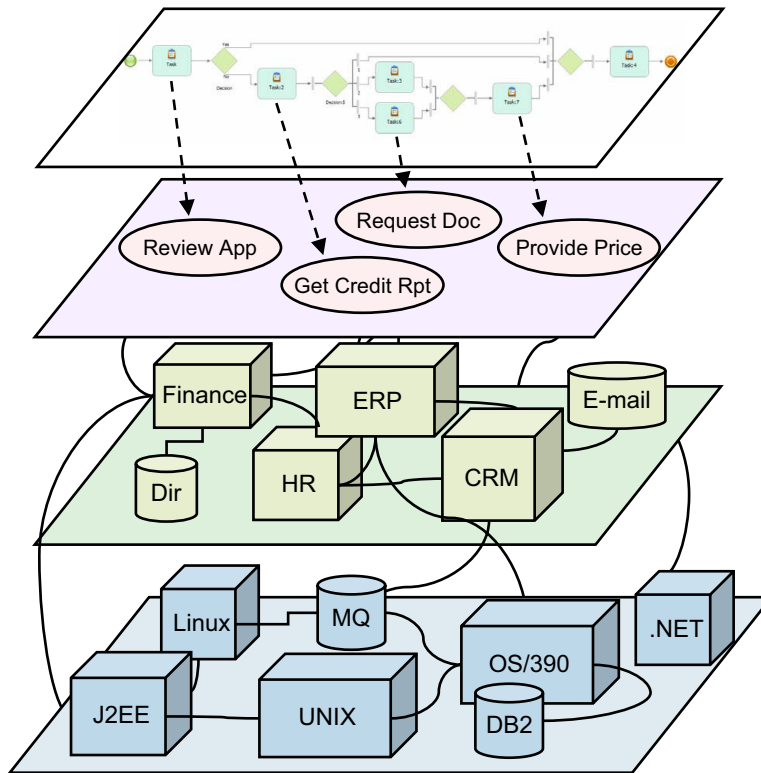
• **Business process layer**
  – Cross functional end-to-end loan process
    • Manual tasks
    • Human tasks
    • Business rules tasks
    • Service calling tasks

• **Service layer**
  – Business Services
  – Dynamic Selection Services

• **Application layer**
  – Applications, components, software

• **Technology layer**
  – Hardware, network
  – Connect J2EE to .NET

© Copyright IBM Corporation 2009

Figure 1-2. The process drives development through the use of business services   WB286 / VB2861.0

Notes:

Purposes of business process modeling

- Business process models serve many purposes, including:
  – Documenting existing procedures
  – Determining requirements for staff, systems, and facilities
  – Planning changes to existing processes and systems
  – Testing and analyzing existing and proposed processes
  – Identifying defects in your processes (bottlenecks, and so forth)
  – Process model data can support other business applications that rely on this information:
    • Workflow, policy and procedure documentation, application development

- Models visually represent an organization's current workflow (an as-is model) and allow what-if scenarios for future (to-be) designs.

- Effective models need a well designed modeling structure.
  – To understand what it takes to complete the activities
  – Ensures consistent and complete representation of information
    • Including normal operations, alternatives, and exceptions to standards

© Copyright IBM Corporation 2009

Figure 1-3. Purposes of business process modeling   WB286 / VB2861.0

Notes:

Why the process layer -- communication of all parties both business and technology, a solid foundation for the future responsiveness of the enterprise to change. Today's software systems are no longer simple like the dog house; they are more complicated like the skyscraper. It is very difficult to understand them without a model. They are also very expensive to implement; therefore it is important to understand the outcome before you start to build them.

Capabilities of WebSphere Business Modeler

- WebSphere Business Modeler capabilities are central to the understanding of the business process model.

    – **Modeling** allows you to create a graphic diagram or a business process plus all the related process information.

    – **Simulation** supports the time and cost analysis of a process under real-time conditions.

    – **Analysis** provides a number of tools to extract details from the model and from simulation results.

    – **Reporting** creates several documents that can be used to communicate the results of process documentation and analysis.

    – **Code generation** generates code that can be used as a starting point for process automation.

Figure 1-4. Capabilities of WebSphere Business Modeler WB286 / VB2861.0

Notes:

WebSphere Business Modeler has many different capabilities depending on the purpose or objectives.

Modeling modes in WebSphere Business Modeler

- Business modeling modes for process mapping:
  - Basic business modeling
  - Advanced business modeling
- Business modeling modes that apply validation rules:
  - WebSphere Business Integration Server Foundation
  - WebSphere MQ Workflow
  - WebSphere Process Server
  - FileNet Business Process Manager
  - WebSphere Business Services Fabric
- When switching modes, the following changes occur:
  - Some options are not available
  - A previously valid model may no longer be valid because of additional validation rules
- No information is lost when switching modes

✔ 🖥 Basic
  🖾 Advanced
  🖳 WebSphere Business Integration Server Foundation
  🖽 WebSphere MQ Workflow
  🖼 WebSphere Process Server
  🖫 FileNet Business Process Manager
  ▦ WebSphere Business Services Fabric
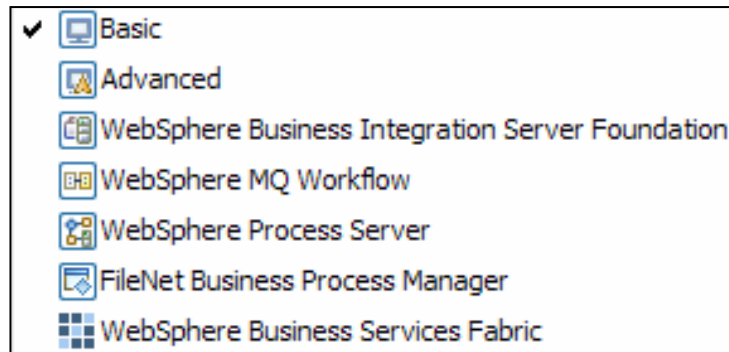
© Copyright IBM Corporation 2009

Figure 1-5. Modeling modes in WebSphere Business Modeler   WB286 / VB2861.0

Notes:

Modeler provides several business modeling modes that filter or reveal information on the model elements or provide validation to support exporting models in a specific format. The mode you choose determines the level of detail you see in diagrams, dialogs, and wizards.

In general, you will use a single mode for all or most of the work you do. If you occasionally want to specify a different level of detail for a model or some aspect within it, you can switch to another business modeling mode.

Four-pane layout

© Copyright IBM Corporation 2009
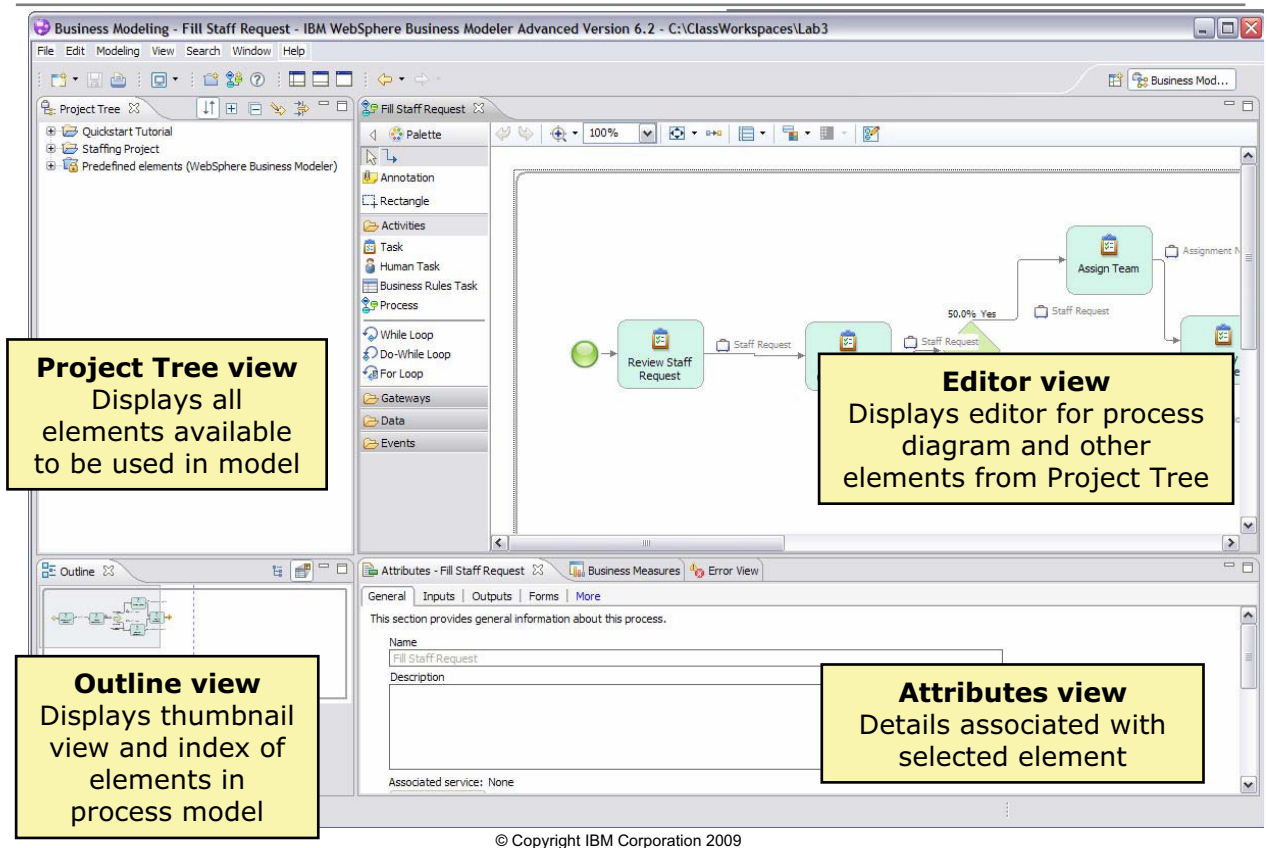
Figure 1-6. Four-pane layout WB286 / VB2861.0

Notes:

The number and type of tabs in the attributes view varies by modeling mode.

Primary modeling elements used in Modeler

Category	Modeler element	Description
Activity Represents the work being performed	Task	Basic unit of work
	Process	Sequence of activities
	Service	Process external to the organization
Data Represents storage area and data map	Repository	Location where business items are stored
	Map	Transforms data from one structure to another
Gateway Determines the process flow	Simple decision	Routes inputs to one of two paths
	Multiple-choice decision	Routes inputs to one of several paths
	Fork	Splits a path into two or more parallel paths
	Merge	Combines two or more paths after an exclusive decision
	Join	Combines two or more parallel paths
	Connection	Links two elements to represent the flow
Event Determines the control flow	Start	Marks the beginning of a process not initiated by another process
	Terminate (Required)	Marks the termination of a process
	End	Marks the end of a path in a process

© Copyright IBM Corporation 2009

Figure 1-7. Primary modeling elements used in Modeler WB286 / VB2861.0

Notes:

Adding relevant information to the diagram

- A model includes a diagram with additional relevant information
  - Information on what is received, worked on, and produced
    - Business items
  - Information about who performs the work and when:
    - Resources
    - Roles
    - Timetables
  - Information on how the company is organized:
    - Organization unit
    - Location
    - Structure
  - Information on grouping related information for analysis:
    - Classifiers
- Information elements are defined and edited using editors opened in the project tree

© Copyright IBM Corporation 2009

Figure 1-8. Adding relevant information to the diagram   WB286 / VB2861.0

Notes:

Additional elements

- These elements serve a specific purpose and make the model more realistic.

- Special purpose tasks
  - Timer
    - Initiates a flow at a specified point in time
  - Broadcaster
    - Publishes a notification
  - Receiver
    - Listens for notifications
  - Observer
    - Watches the repository contents

Figure 1-9. Additional elements WB286 / VB2861.0

Notes:
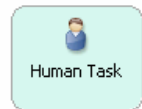
Human task (1 of 2)

- Specialized task a system assigns to human for completion
  - Used to visually identify and document activities that must be performed by a person
- Can be global or local
  - Local task to local human task conversion
  - Local human task to global human task conversion
- All other normal task attributes
- Treated as a normal task during simulation
  - For process modeling and simulation purposes, you can specify the related cost, revenue, duration, additional resources, organizations, and classifiers
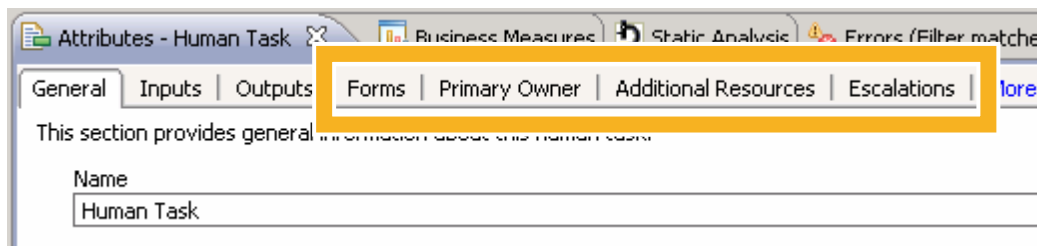
© Copyright IBM Corporation 2009

Figure 1-10. Human task (1 of 2) WB286 / VB2861.0

Notes:

To capture the points at which human intervention is needed in a process, you can model the type of human task in which an automated system notifies a person of the need for action.

A human task is a visually distinct, specialized task that you can use to specify who should take responsibility for the activity and what escalation process should take place if the required person is unavailable for a certain amount of time. Because human tasks typically take longer than automated tasks and involve key activities (for example, approving a large loan), it often makes sense to track human tasks in a business activity monitoring application at run time. By adding human tasks to your process models, you can define the requirements for these tasks for both documentation and application development purposes.

In previous releases of WebSphere Business Modeler, if a role or individual resource definition of Person or Staff (or a subtype of these) was assigned to a task, a human task with a potential owner was created during the export to WebSphere Integration Developer. Now that WebSphere Business Modeler provides a human task element, this functionality

has been removed. If you still want these tasks to be exported to WebSphere Integration Developer as human tasks, you can convert them to human tasks or set their implementation type to human task prior to exporting them.

Human task (2 of 2)

- Associate electronic forms that are required for completion
  - Forms integrate the development of the process and the associated computer interface
  - Based on IBM Lotus Forms, Forms Designer, and Forms Viewer
  - Created or imported forms can be reused by other human tasks
  - Forms are exported to WebSphere Integration Developer
- Primary owner
  - Assign a particular role or resource to work on the task
  - Ability to define a criterion (known as a *Verb* in WebSphere Integration Developer) that determines the resource to be allocated as a primary owner
- Escalation
  - Define actions that should take place if some aspect of the human task does not complete on time
- Can have only one input criterion (set of inputs) and one output criterion (set of outputs)

© Copyright IBM Corporation 2009

Figure 1-11. Human task (2 of 2)   WB286 / VB2861.0

Notes:

Business rules task (1 of 2)

- Specialized task
- Represents activities to which business rules apply
- Can be global (reusable) or local (process-specific)
- Used to model complex decisions and to visually identify places in your process model where business policies and practices apply
- Simplifies modeling when a business decision takes the form of a series of if-then statements or a large number of unstructured sentences
- To define rule conditions and actions, use Intermediate, Advanced, or WebSphere Process Server modeling mode

Figure 1-12. Business rules task (1 of 2)   WB286 / VB2861.0

Notes:

When a business decision takes the form of a series of if-then statements or a large number of unstructured sentences, you can use a business rules task to capture the business rules.

Depending on the modeling mode in which you work, you can specify different levels of detail for your business rules. For example, if you want to provide only a name and description for each business rule, you might want to use the Basic modeling mode. If you want to define rule conditions and actions for your business rules, you need to use the Intermediate, Advanced, or WebSphere Process Server modeling mode. However, if you switch from a more advanced modeling mode to the Basic mode, some information is filtered out of your view of the business rules.

As you can for other tasks, you can specify the related cost, revenue, duration, inputs, outputs, resources, organizations, and classifiers for business rules tasks. However, a business rules task can have only one set of inputs and outputs. Other than the task inputs and outputs, these additional task specifications apply to process modeling only. You can use this modeling information to run a simulation that treats the business rules task like a

generic task (that is, the rule logic defined for the business rules task is not run as part of the simulation). The task information required for simulation is not included with the business rules when you export a business rules task from WebSphere Business Modeler.

You can define one or more business rules for a business rules task, and you can schedule when these business rules should take effect.

Business rules task (2 of 2)

- Business rule
  - Simple if-then logic
  - If a condition evaluates to true, then actions are invoked
- Business rule template
  - Create a rule template to reuse rule conditions and actions, or allow their parameter values to be changed in an application at run time

© Copyright IBM Corporation 2009

Figure 1-13. Business rules task (2 of 2)　　　　　　　　　　　　　　　　　　　　WB286 / VB2861.0

Notes:

　　　　　　© Copyright IBM Corp. 2003, 2009

Benefits of using Rational RequisitePro

- Single, centralized requirement collection point for all requirements.
  - Provides a unified interface with which to analyze and compare requirements
- Trace requirements to line items
- Share more information with your development teams about the requirements
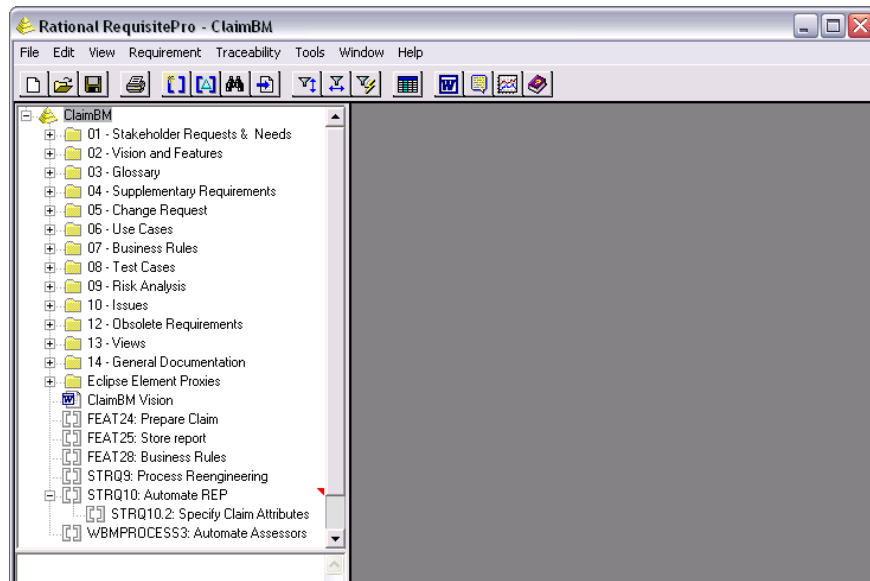
© Copyright IBM Corporation 2009

Figure 1-14. Benefits of using Rational RequisitePro   WB286 / VB2861.0

Notes:

Validation fundamentals

- Syntax: Model constructs are correct and valid.
  - Is the model properly constructed to provide valid results in the Modeler?

- Semantics: The meaning of the model is correct — task attributes, organizations, roles, sequence of tasks.
  - Does the model created reflect what is occurring in the business, or what could occur in the business?
  - Is it thorough; was any data left out?

- Sense: The model is business relevant; cost (time and money) assumptions and their causes are valid.
  - Does it make sense that the model and resulting analysis show on average that it takes three weeks to process a claim when company metrics would suggest one week?

- Standards: The model adheres to the defined modeling standards — constructs, naming conventions.
  - Will the model be able to be understood by someone who was not involved with its creation?

Figure 1-15. Validation fundamentals WB286 / VB2861.0

Notes:

Static analysis overview

- Gives business users important information computed from the raw data in the models:

  - Cost
  - Time
  - Performance
  - Improvement capabilities
  - Process flow validity
  - Resources leveling
  - Qualified resources to play important roles
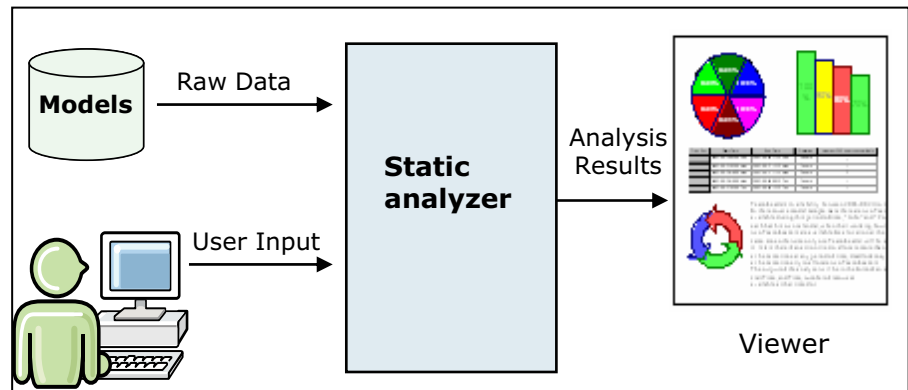
- Inputs are raw model data and parameters entered by the user.
- Results are viewed using either a tabular or graphical viewer.
  - Results can be printed using predefined report templates.

© Copyright IBM Corporation 2009

Figure 1-16. Static analysis overview   WB286 / VB2861.0

Notes:

Querying, reporting, and printing

- Queries enable you to extract and view selected information on elements of your models
- Reports are a formatted presentation of information relating to a model or to the results of analyzing a process simulation.
- Reports can be viewed, printed, or exported
- Reports versus queries
  - All predefined queries have a corresponding predefined report based on the query.
    - Use the query to view the information.
    - Use the report if you want to format, print, or save the information
- Diagrams can also be printed or exported
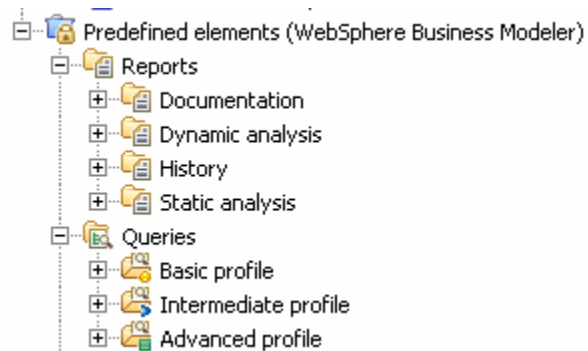
© Copyright IBM Corporation 2009

Figure 1-17. Querying, reporting, and printing   WB286 / VB2861.0

Notes:

Defining standards and agreeing to best practices

- Your stakeholders will also help you define the standards and gain the agreement required to maintain best practices:
  - WebSphere Business Modeler is methodology independent, but successful modeling efforts require a level of standardization and a defined approach.
  - Process modeling standards:
    - It is necessary to define the use, creation, and implementation of the symbols, definitions, and data descriptions.

Kick-off

Standards

As-is

Symbols

Interviews

Reports

To-be

Measures
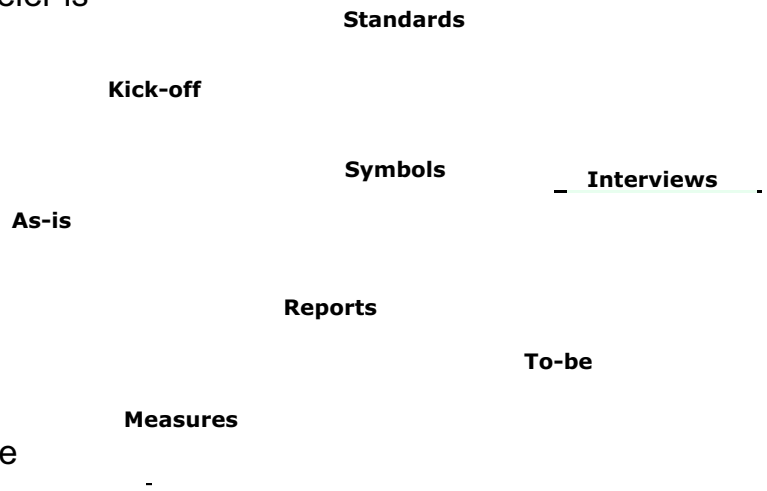
© Copyright IBM Corporation 2009

Figure 1-18. Defining standards and agreeing to best practices   WB286 / VB2861.0

Notes:

Need for project versioning

- To distribute the effort of modeling or modifying an entire project among multiple team members.
  - Members can view and post project artifacts to a version control system.
  - Check out processes and create their local versions.
    - Submit their changes back when done
- Modeler can use IBM ClearCase or Concurrent Versions System (CVS) to access a version control repository on a server.
  - Maintain secured version control of project data in the repository
  - Each modification of a project element (such as process, resource, or catalog) stored as a distinct version of the original item
  - Post business modeling projects to share, view, make copies of the shared projects, and save the copies to their local machine
  - View the history of project element modifications
  - Compare two or more versions of the same item

Figure 1-19. Need for project versioning   WB286 / VB2861.0

Notes:

How users interact with publishing server

- Users may include business analysts, consultants, or process engineers.

- Reviewers may include executives, consultants, employees, partners, and even customers.

- Reviewers validate the data used to create the process model or provide feedback.

- Users make adjustments to the process based on reviewer feedback.

- Publish a single model element, a complete catalog, or the entire process model project.

- The reviewers can then comment on the updated process model or respond to comments.

- This creates an environment for continuous improvement of the process model.
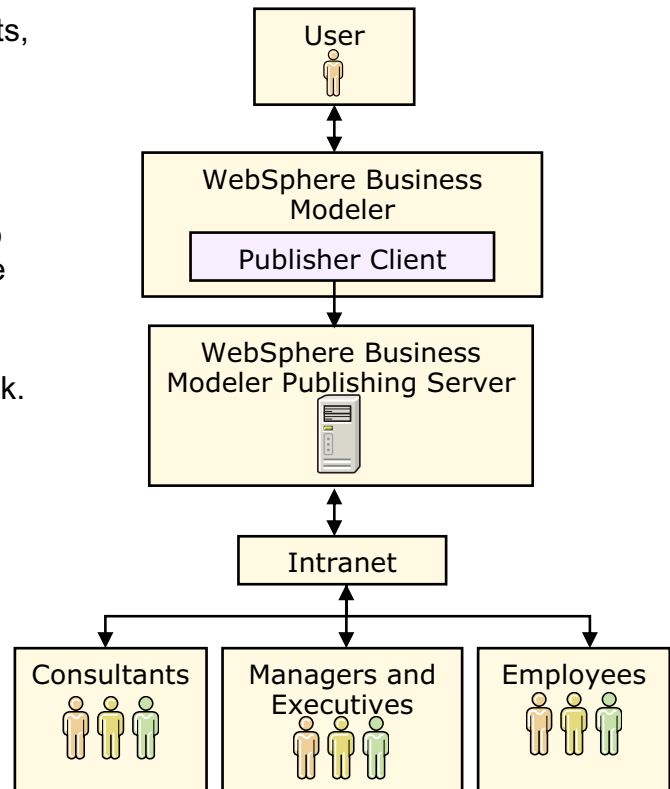
© Copyright IBM Corporation 2009

Figure 1-20. How users interact with publishing server   WB286 / VB2861.0

Notes:

Users of WebSphere Business Modeler Publishing Server can interact with a publishing server using publisher clients and Web browser clients.

Users who have WebSphere Business Modeler can use its publisher client to send business processes to a publishing server. Users with Web browsers can be reviewers who validate the data used to create the process model or provide feedback so that the modeling team can update the model or people who want to reference the process model for information. These users may include executives, consultants, employees, partners, and even customers.

Importing from Microsoft Visio

- Import shapes from Microsoft Visio files from Microsoft Visio 2002 or newer.

- These shapes can be used to create elements such as tasks and business items in Business Modeler.

- Predefined mappings include all shapes from the Basic Flowchart stencil, IDEF0 stencil, and SDL Diagram stencil.

- Customize your own mappings.

© Copyright IBM Corporation 2009

Figure 1-21. Importing from Microsoft Visio   WB286 / VB2861.0

Notes:

© Copyright IBM Corp. 2003, 2009

Modeler's relationship with other products covered in this course
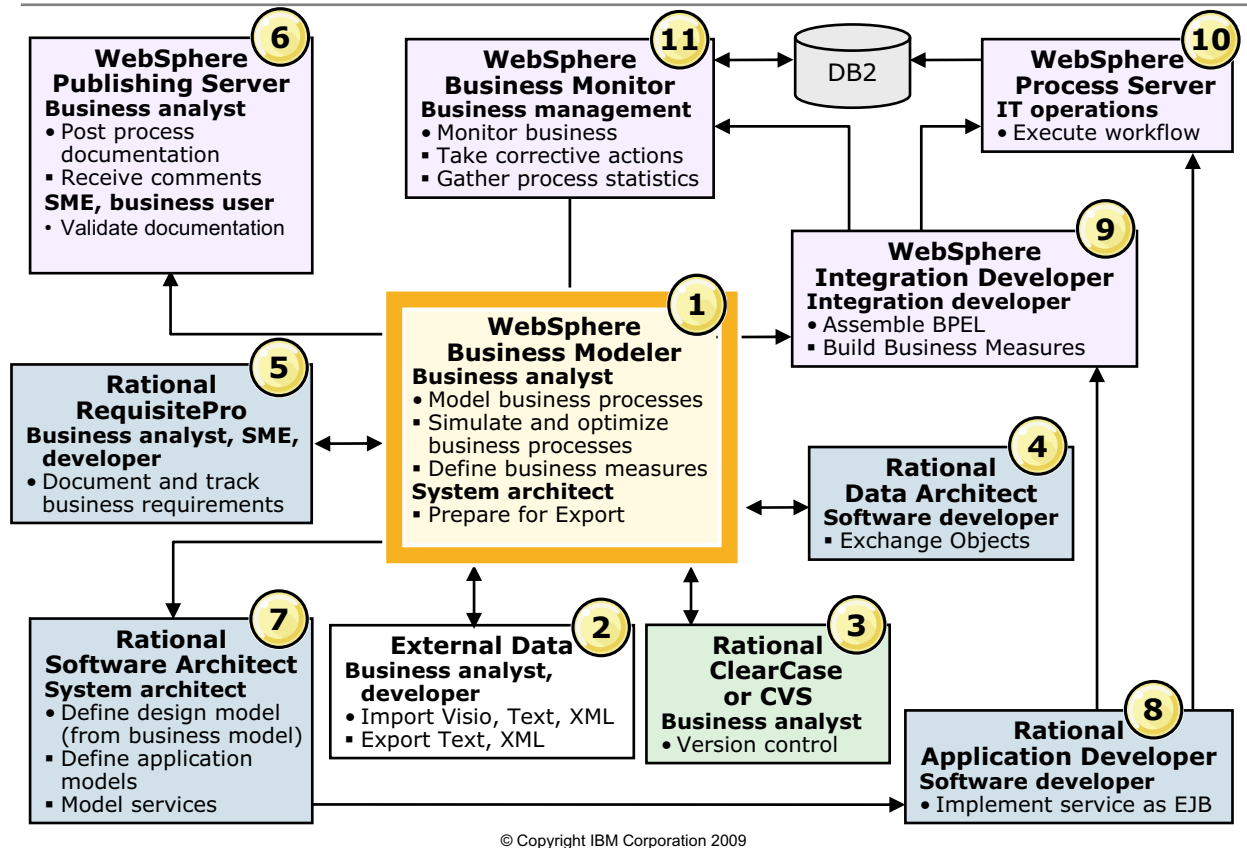
Figure 1-22. Modeler's relationship with other products covered in this course   WB286 / VB2861.0

Notes:

This slide shows the integration between WebSphere Business Modeler and other IBM and non-IBM products. The numbers on this slide do NOT represent a sequence of events.

1. A process model is built using existing information or future design information in WebSphere Business Modeler.

2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.

3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.

4. Additional IT information can be imported from Rational Data Architect to support development.

5. Business requirements are synchronized with the process model using Rational RequisitePro.

6. Models are exported to WebSphere Publishing Server for review (using a Web browser) during development and later in production.

7. When the new process is ready for development, UML models for building new services are exported to Rational Software Architect.

8. Once the software design is done, the code is developed in Rational Application Developer and exported for further development and execution.

9. Workflow code is developed in WebSphere Integration Developer using the BPEL code generated from the model and using the WSDLs interfaces that were developed. The completed code is exported for execution and monitoring.

10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.

11. Production data is monitored by management using WebSphere Business Monitor. Production data can be exported from WebSphere Business Monitor and imported into WebSphere Business Modeler for future analysis.

Unit summary

Having completed this unit, you should be able to:
• Explain the key concepts that were covered in the process mapping and analysis course

Figure 1-23. Unit summary   WB286 / VB2861.0

Notes:

Unit 2. Introduction to simulation and analysis

What this unit is about

This unit describes the introduction to simulation and analysis

What you should be able to do

After completing this unit, you should be able to:

- Explain business process analysis
- Describe the purpose of simulation
- Define simulation terminology

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
- Explain business process analysis
- Describe the purpose of simulation
- Define simulation terminology

Figure 2-1. Unit objectives   WB286 / VB2861.0

Notes:

Simulation and analysis are core Modeler features
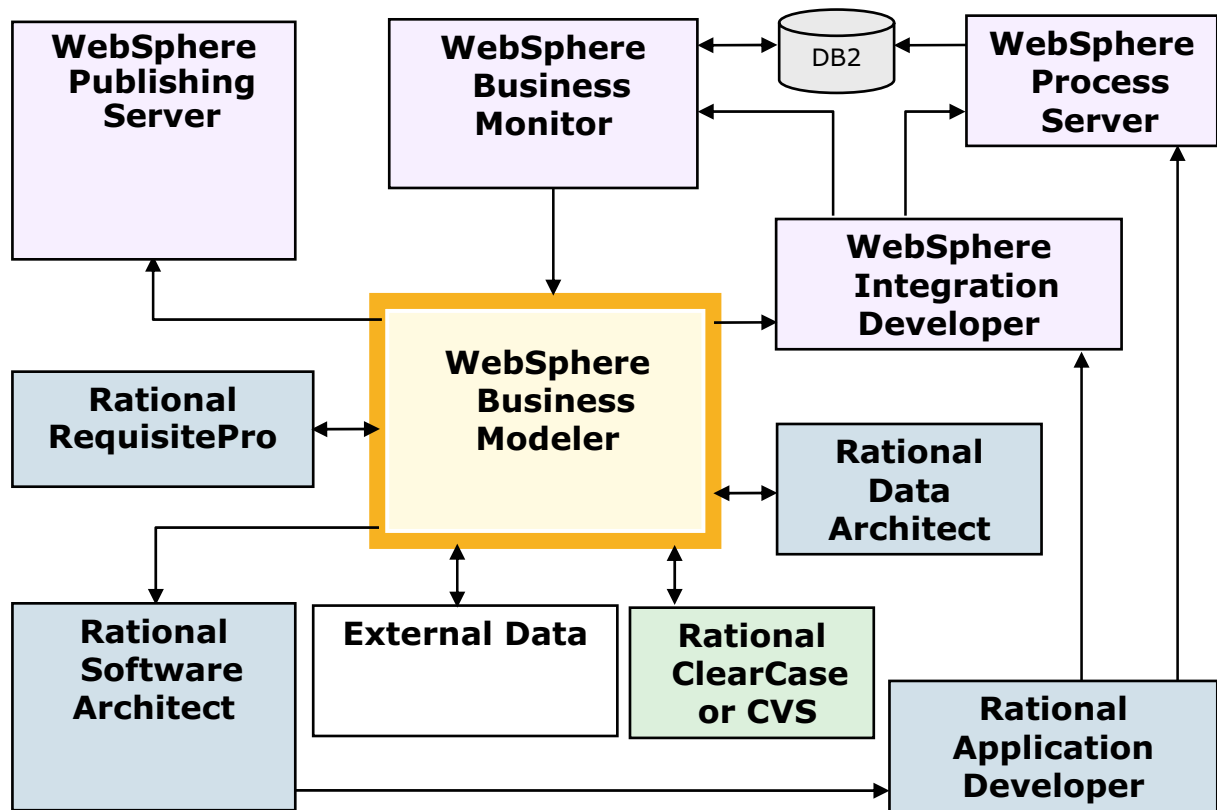
Figure 2-2. Simulation and analysis are core Modeler features   WB286 / VB2861.0

Notes:

Business process analysis

- An analysis discipline focused on how an organization:
  – Reduces overall costs
  – Effectively uses its resources
  – Supports its customers better

- Takes an end-to-end view of the business

- Closely related to requirements definition
  – Changes to polices, processes, and information systems

- Key to business process management
  – Making process more efficient, effective, and adaptable

- Based on simulating a process under real-life conditions
  – Varying times, costs, schedules, and resources

Figure 2-3. Business process analysis WB286 / VB2861.0

Notes:

What is process simulation?

- Simulation:
  - The imitative representation of the functioning of one system or process by means of the functioning of another (a computer simulation of an industrial process). — Merriam-Webster

- Process simulation:
  - Using a computer program based on a set of mathematical formulas to imitate the behavior of a business process to determine how it behaves under different conditions.
  - If the model behaves in the same manner as the real process:
    - There is a good chance that the underlying variables are correct.
    - The model can be used to test the impact of changing conditions.

- Process simulation is a simulated performance of a real-world business process in a virtual environment.
  - The business process might be a model of:
    - An existing business process.
    - One that is planned for the future.

© Copyright IBM Corporation 2009

Figure 2-4. What is process simulation?   WB286 / VB2861.0

Notes:

The value of simulating business processes

- Simulation is a core component of WebSphere Business Modeler.
  - Can run simulations of non-business processes with limitations

- Simulations can be used to:
  - Observe a process in action
  - Examine the statistics generated by a process as it runs
  - Perform analysis on the simulation results (dynamic analysis)

- Changing a diagram or other model elements allows comparative analysis.
  - Quantify the effects of the changes
    - Assess the costs and benefits of changing your business processes
  - Observe how a process will perform in response to variations on inputs to the process
    - Vary process input volume over time

© Copyright IBM Corporation 2009

Figure 2-5. The value of simulating business processes   WB286 / VB2861.0

Notes:

Simulation terminology (1)

- Simulation snapshot:
  - A record of the model that will be simulated

- Simulation profile:
  - A record of the model plus the simulation attributes

- Statistics and results:
  - The information produced by the simulation

- Probabilities or expressions:
  - The way decisions are handled during a simulation

- Tokens:
  - Representations of units of work passing through the process

Figure 2-6. Simulation terminology (1)   WB286 / VB2861.0

Notes:

Simulation terminology (2)

- Process instances:
  - Each execution of a process simulation

- Process cases:
  - Each path through a process

- Random number generation:
  - The introduction of real-life variability into a simulation

© Copyright IBM Corporation 2009

Figure 2-7. Simulation terminology (2)   WB286 / VB2861.0

Notes:

Simulation snapshots

- A record of the complete process model at the moment you ran a simulation of the process.
  - A copy of all the elements in the project that the process uses
    - Business items, resources, and global tasks

- Need to create multiple snapshots for each set of changes to compare the effects of those changes.

- Elements created by a snapshot:
  - Simulation snapshot settings
  - Simulation profile

- Once a snapshot is created, the changes to the original model will not be reflected in the snapshot.
  - To include changes, a new snapshot needs to be generated.

Figure 2-8. Simulation snapshots   WB286 / VB2861.0

Notes:

Simulation profiles

- A simulation profile is a copy of a process model augmented with simulation attributes used to run the simulation.
  - The profile is based on the process model at the time the snapshot was created.

- Attribute values you set in a simulation profile are used when you analyze the profile or run a simulation.
  - Attributes are copies of snapshot settings: token creation, cost, revenue, duration, and resource requirements.
  - Attributes can override values inherited from the simulation snapshot.

- Multiple simulation profiles can be created for a single simulation snapshot.
  - Compare the results of your process in different "what-if" business scenarios
    - For example, increase in volume

- You can add breakpoints and interrupts to a simulation profile to cause a process to pause in the middle of a simulation run.
  - Breakpoint pauses the simulation run when that activity is activated by an incoming token.
  - An interrupt pauses the simulation run when a specified condition occurs.

© Copyright IBM Corporation 2009

Figure 2-9. Simulation profiles   WB286 / VB2861.0

Notes:

Statistics and results

- Simulations provide two kinds of information about processes:
  - Simulation statistics are generated while the simulation is running.
  - Simulation results are compiled when the simulation has completed.
  - You can enable or disable the collection of statistics and results in the simulation control panel.

- Simulation statistics are details about the instances of processes, tasks, and connections.
  - The simulation control panel displays simulation statistics on the Processes, Tasks, and Connections tabs.
  - Statistics are constantly updated while the simulation is in progress.
  - Choose to display either:
    - Statistics for individual process instances
    - Collected statistics based on all process instances

- Simulation results are sets of data recorded during each simulation run and are used in dynamic analyses.
  - Results are stored in a database.
  - A results node is added to the Project Tree as a child of the simulation profile.
    - Each run produces its own simulation results node.

© Copyright IBM Corporation 2009

Figure 2-10. Statistics and results   WB286 / VB2861.0

Notes:

Probabilities and expressions (1)

- Profiles can be set up to use one of two different methods of selecting a path:
  - Probabilities are specified in the attributes as percentages.
  - Expressions are created with the expression editor.

- Probabilities:
  - Probabilities allow you to set up and run a simulation more quickly.
    - Relatively little data setup in a model
  - Specify probabilities on decision choices, loops, and task outputs.
  - Sufficient to perform most simulations.
    - Except for very detailed low-level analysis
  - Use probability-based simulation for current state modeling and possible future state analysis.

Figure 2-11. Probabilities and expressions (1)   WB286 / VB2861.0

Notes:

Probabilities and expressions (2)

- Expressions:
  - The expression editor is required to create an expression for each possible path.
  - Used for:
    - Low-level future state business models
    - Models that clearly define the interfaces in and out of tasks and other elements

- Expressions specify how specific data will be treated as it passes through the process.
  - For example, an order might be handled differently depending on the customer type or depending on the total cost of the order.
    - Business item creation rules could be used to determine the specifics of each order.
    - Expressions on decisions and activities evaluate the incoming order and handle it according to the specific details it contains.

© Copyright IBM Corporation 2009

Figure 2-12. Probabilities and expressions (2)   WB286 / VB2861.0

Notes:

Tokens

- A token represents a unit of work that is received by a process and transferred between different activities in the process flow.
  - Some tokens represent the transfer of data between activities, while other tokens represent only a transfer of control.

- Token creation settings define the quantity and rate of inputs that the process receives in a simulation run.
  - The frequency can be generated at a constant rate or a statistically distributed rate.
  - The number of tokens can be generated individually or in bundles.

- A large number of tokens may have to be run through a process to achieve a statistically significant simulation result that can be used for dynamic analysis.
  - One formula that can be used to determine the minimum number of tokens to use in a probability based simulation is:
    - Number of cases multiplied by (highest case probability / lowest case probability)

Figure 2-13. Tokens   WB286 / VB2861.0

Notes:

Process instances

- A process instance is a unique occurrence of the process during simulation.

- Arrival of tokens initiates a process instance defined by a model.
  - The process run either completes successfully or fails.
  - For example, in a model of a call center, a process instance represents the handling of a call from an individual customer.

- Instance analysis looks at the activities within a particular instance of a process that is created during a simulation run.

- Aggregated analysis looks at specific elements within a process aggregated across all process instances in a simulation run.

- A task instance is the execution of a specific task within a process instance.

Figure 2-14. Process instances WB286 / VB2861.0

Notes:

Process cases

- A process case is a path a process instance can take.

- In a process case, units of work follow a particular pattern of connections and activities through a branching process flow.
  - The path followed during simulation is determined by probabilities or expressions.

- Cases include both the main paths and all the exception paths.

- The greater the number of cases, the larger the number of tokens that need to be generated for a statistically significant result.

- Analyzing the process cases helps identify the variations in performance between different patterns of process flow.
  - Individual cases may have a significant effect on the overall process.

© Copyright IBM Corporation 2009

Figure 2-15. Process cases WB286 / VB2861.0

Notes:

Random number generator

- A **random number generator** is a computational or physical device designed to generate a sequence of numbers that lack any pattern.

- Random numbers are used to drive the variation in frequencies, times, and costs.

- Statistical distributions can be used to generate the values used in the model calculations.

- A random number seed is used to start the random number generation.
  – You can control the random number seed.

- The random pattern makes the model more realistic.
  – For example, you may say an order comes on average once every five minutes, but in reality the time between orders is continually varying.

Figure 2-16. Random number generator

WB286 / VB2861.0

Notes:

Random number seed (1)

- The random number seed is the starting point for a series of numbers.
  - This setting defines a random number, which determines a fixed starting point for the sequence of random values that are used in a simulation.
    - Setting a random number seed other than zero makes it possible to precisely reproduce a simulation run for each simulation with an identical profile.
  - Setting a value of zero causes the system to generate the random number seed.
    - This means that multiple runs of an identical profile may result in different simulated behavior because random decisions are made differently from run to run.

- When to use zero:
  - Use zero when trying to understand how a process behaves under normal conditions.
  - Each time it runs there are slight statistical variations which is very realistic.
  - Use zero to understand the effect of variations on the performance of a process.

© Copyright IBM Corporation 2009

Figure 2-17. Random number seed (1)   WB286 / VB2861.0

Notes:

Random number seed (2)

- When to use a fixed number:
  - Use fixed numbers when trying to compare two different processes under similar conditions.
  - Use fixed numbers to hold the statistical variation constant while comparing two processes.

- When to use multiple fixed numbers:
  - Use multiple fixed numbers to compare two different processes under varying statistical conditions.

Figure 2-18. Random number seed (2)   WB286 / VB2861.0

Notes:

Checkpoint

1. What is the difference between a simulation profile and a simulation snapshot?

   _____

2. What two methods can be used to determine a path in a model?

   _____

3. What is the purpose of the random number seed?

   _____

4. When would you use a fixed random number seed instead of zero?

   _____

© Copyright IBM Corporation 2009

Figure 2-19. Checkpoint   WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

3.

4.

© Copyright IBM Corp. 2003, 2009

Unit summary

Having completed this unit, you should be able to:
• Explain business process analysis
• Describe the purpose of simulation
• Define simulation terminology

© Copyright IBM Corporation 2009

Figure 2-20. Checkpoint solution WB286 / VB2861.0

Notes:

Checkpoint solution

1. What is the difference between a simulation profile and a simulation snapshot?
   A simulation snapshot is a record of the model that will be simulated. A simulation profile is a record of the model plus the simulation attributes.
2. What two methods can be used to determine a path in a model?
   Probabilities and expressions.
3. What is the purpose of the random number seed?
   The random number seed is the starting point for a series of numbers. This setting defines a random number, which determines a fixed starting point for the sequence of random values that are used in a simulation.
4. When would you use a fixed random number seed instead of zero?
   Use fixed numbers when trying to compare two different processes under similar conditions. Use fixed numbers to hold the statistical variation constant while comparing two processes.

Figure 2-21. Unit summary   WB286 / VB2861.0

Notes:

Unit 3. Setting up and running simulations

What this unit is about

This unit describes the setting up and running simulations.

What you should be able to do

After completing this unit, you should be able to:

- Describe element behavior in simulations
- Create a snapshot
- Define simulation attributes
- Define simulation preferences

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
• Describe element behavior in simulations
• Create a snapshot
• Define simulation attributes
• Define simulation preferences

Figure 3-1. Unit objectives   WB286 / VB2861.0

Notes:

Setting up and running simulations


```
WebSphere          WebSphere              DB2        WebSphere
Publishing         Business                          Process
Server             Monitor                           Server

                                    WebSphere
                                    Integration
                                    Developer
Rational           WebSphere
RequisitePro       Business                     Rational
                   Modeler                      Data
                                                Architect

Rational           External Data    Rational
Software                            ClearCase            Rational
Architect                           or CVS               Application
                                                         Developer
```
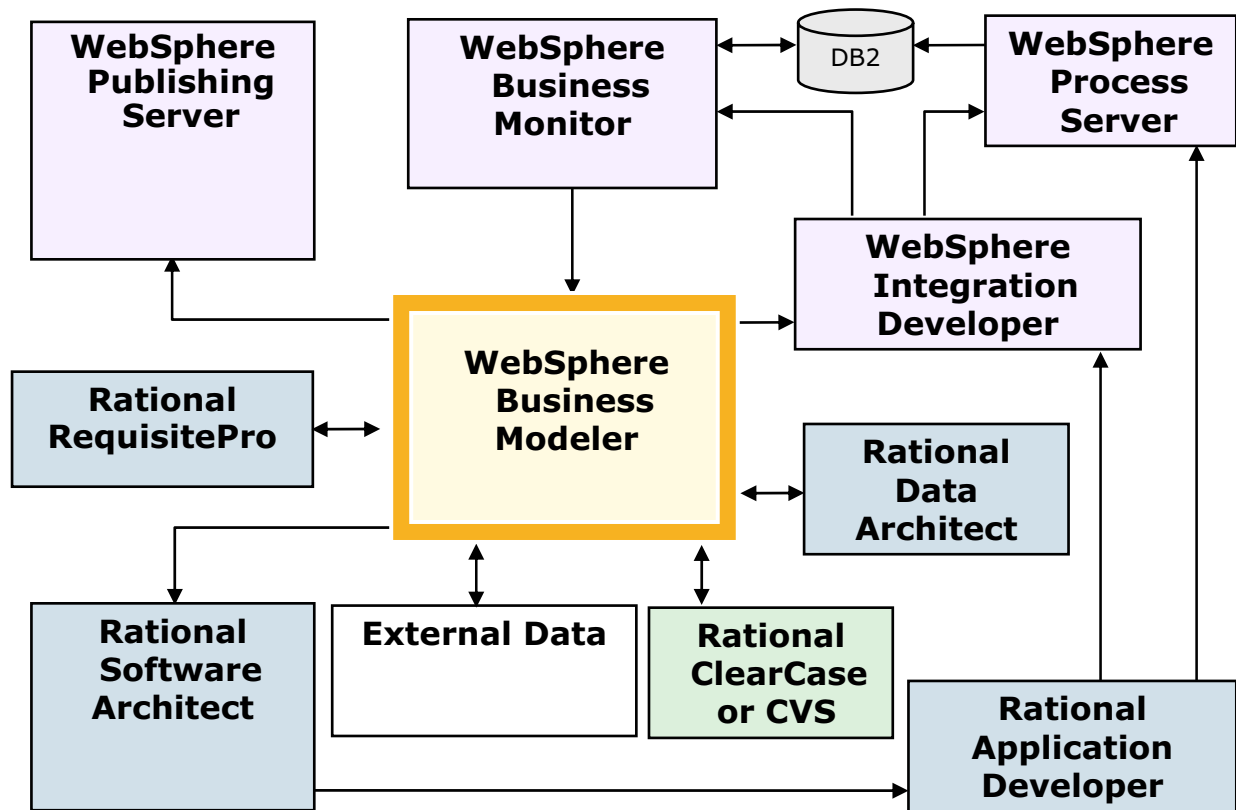
© Copyright IBM Corporation 2009

Figure 3-2. Setting up and running simulations WB286 / VB2861.0

Notes:

Element behavior in simulation

- Process time and cost
  - Accumulated from the attributes of all the included element attributes
  - Process attributes are used if there are no elements inside

- Service time and cost
  - Attributes determine how it performs work

- Task and map
  - Attributes determine the time and cost of its work
  - Escalations in human tasks are not evaluated
  - Business rules tasks are treated like generic tasks (business rules not evaluated)

- Timer, broadcaster, receiver, repository, timetable
  - Attributes affect the behavior of the process

- Decisions, merges, forks and joins
  - Use attributes to affect the flow of the process through probabilities or expressions

© Copyright IBM Corporation 2009

Figure 3-3. Element behavior in simulation WB286 / VB2861.0

Notes:

© Copyright IBM Corp. 2003, 2009

Role and resource behavior in simulations

- Roles and resources
  - Determine time and cost based on specified allocations
  - Resource attributes take precedence over role attributes
  - In human task, primary owner is treated as a normal resource or role requirement

- Costs for resources and roles
  - If you define costs for both resources and roles, the resource cost takes priority
    - Role cost is used only if no other cost is associated with the resource
  - For a process containing an activity that has a requirement for a role.
    - The resource cost of the activity is based on the cost of the qualified resource that is allocated to the activity

- Resource and role allocations
  - There is no capability to select specific resources to be allocated for simulations
  - If a process instance ends before an activity role or resource allocation time is complete, the roles or resources are de-allocated from the activity and can be allocated to another activity
  - A role or resource allocation may be split into multiple intervals, if the allocated role or resource is not continuously available for the entire duration of the resource requirement

© Copyright IBM Corporation 2009

Figure 3-4. Role and resource behavior in simulations   WB286 / VB2861.0

Notes:

Resource allocation – If you want to represent a call center where the manager of the department starts to take calls after all the operators are on the phone, you have to create additional logic in the model to accomplish this. There is no way to tell the simulator to assign all the operators before selecting the manager to perform the Customer Representative role. The system selects them randomly.

For example, if the customer service role has a cost of $25 an hour but the individual resource that is assigned to the activity, John Doe, has a cost of $22 an hour, the resource cost will be based on $22 an hour. If no cost is defined for the allocated resource, the role cost is used to determine the activity resource cost.

Task duration and resource requirements

- Duration is used to determine cycle time
- Resource time required is used to determine cost
- Often the resource time and duration are equal
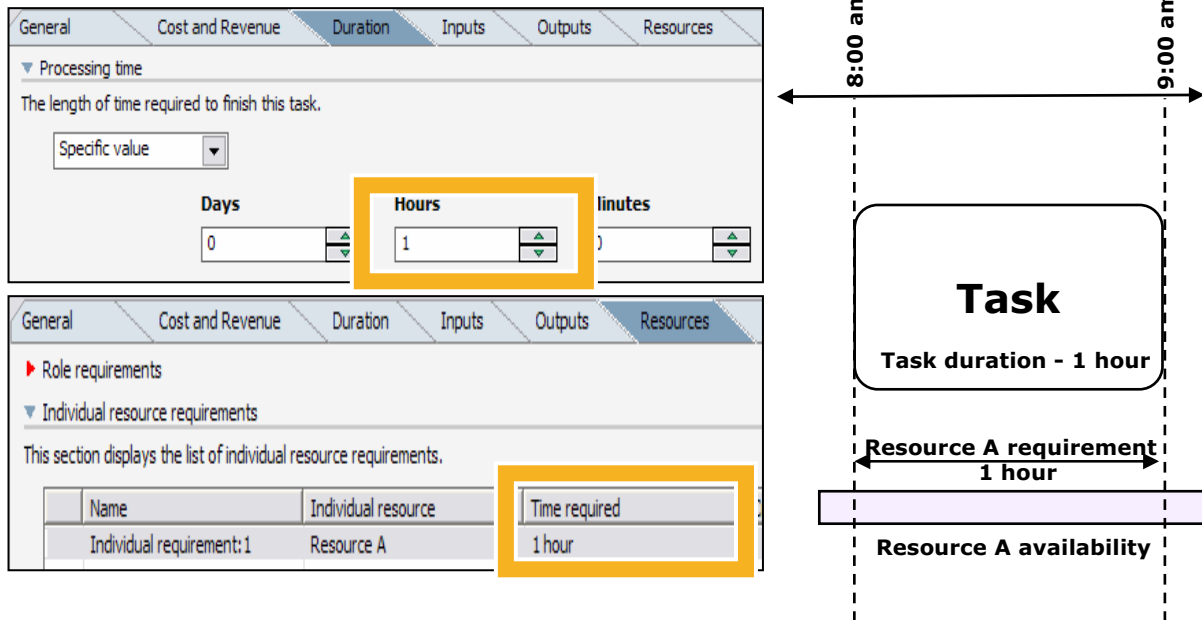
© Copyright IBM Corporation 2009

Figure 3-5. Task duration and resource requirements　　　　　　　　　　　　WB286 / VB2861.0

Notes:

Resource time required is independent of duration

- Resource time required can be shorter or longer than duration
- All resources most be available to start the task
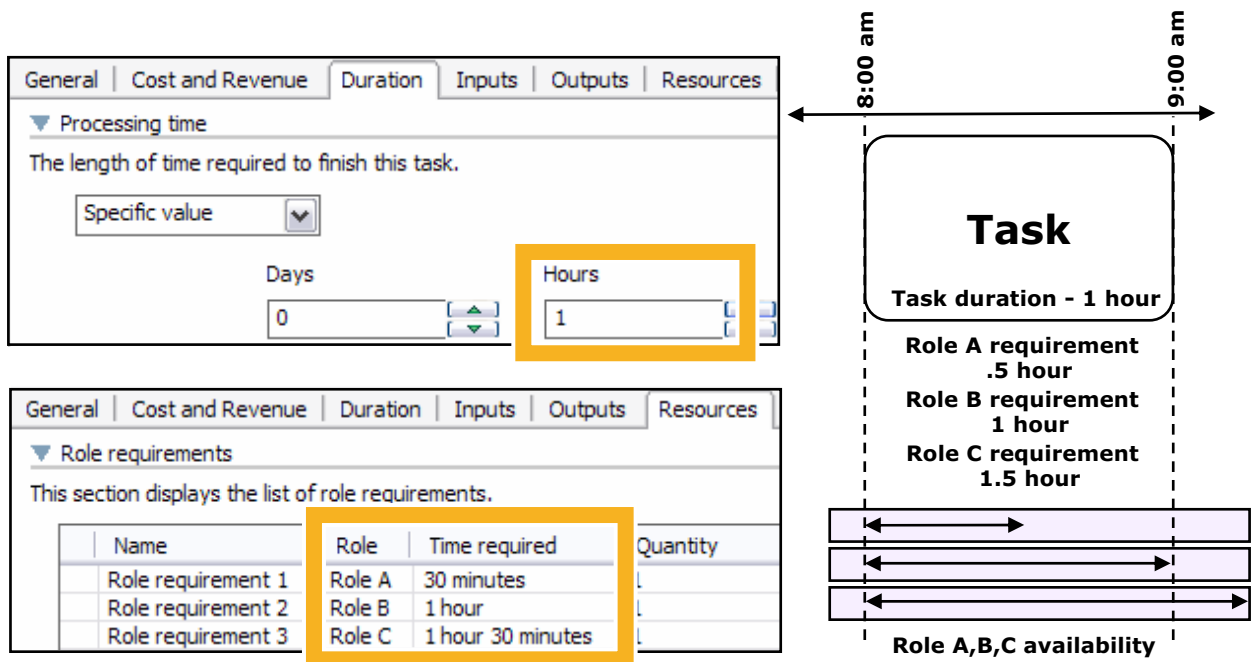
© Copyright IBM Corporation 2009

Figure 3-6. Resource time required is independent of duration   WB286 / VB2861.0

Notes:

Single resource: task time equals resource time

- **Use resources' time required as a task processing time**
  - Set to "Yes"
  - Wait for resource end time to complete a task
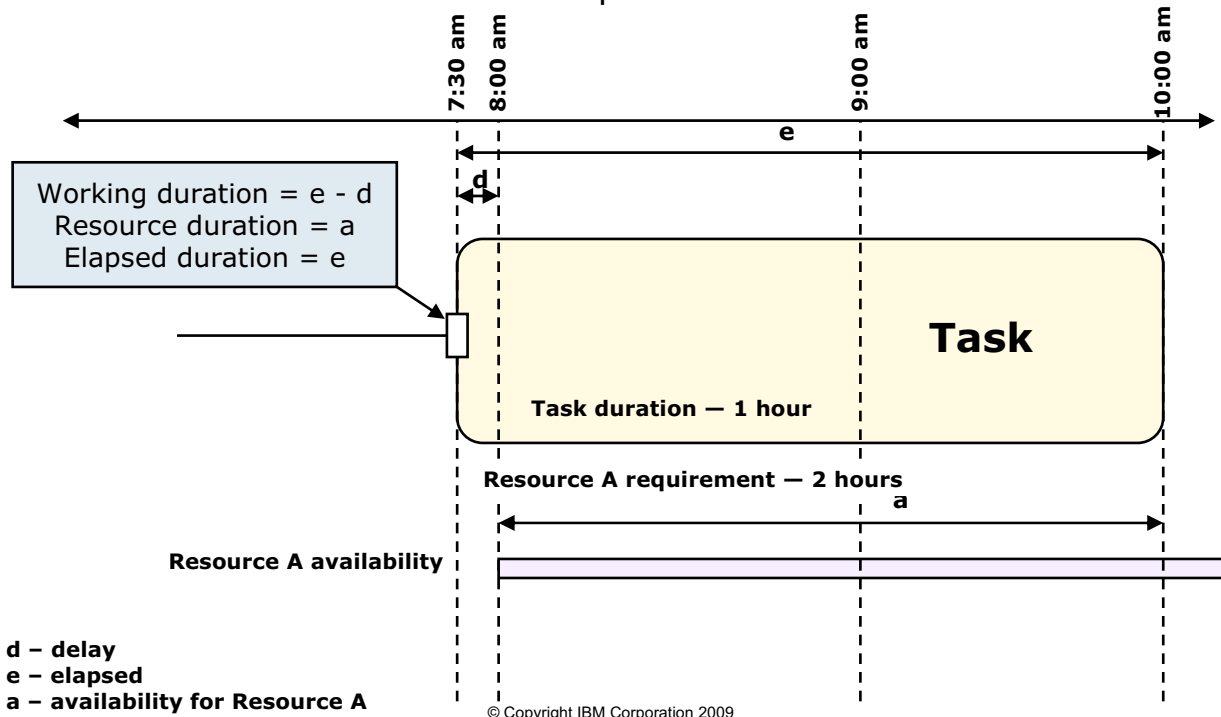
Figure 3-7. Single resource: task time equals resource time   WB286 / VB2861.0

Notes:

If the Task behavior with simulation preference set to "Yes," the task has stretched to two hours for the processing time.

Single resource: task time equals set duration

- **Use resources' time required as a task processing time**
  - Set to "No"
  - Use duration for time to complete a task


```
                    7:30 am  8:00 am              9:00 am                    10:00 am

                                          e

        ┌─────────────────────┐    d
        │ Working duration = e - d │
        │ Resource duration = a    │
        │ Elapsed duration = e     │         ┌──────────────────────┐
        └─────────────────────┘         │                          │
                                        │        Task              │
                        ──────────┤     │                          │
                                        │  Task duration — 1 hour  │
                                        └──────────────────────┘

                                   Resource A requirement — 2 hours
                                                              a

        Resource A availability  ├──────────────────────────────────┤

   d – delay
   e – elapsed
   a – availability for Resource A    © Copyright IBM Corporation 2009
```
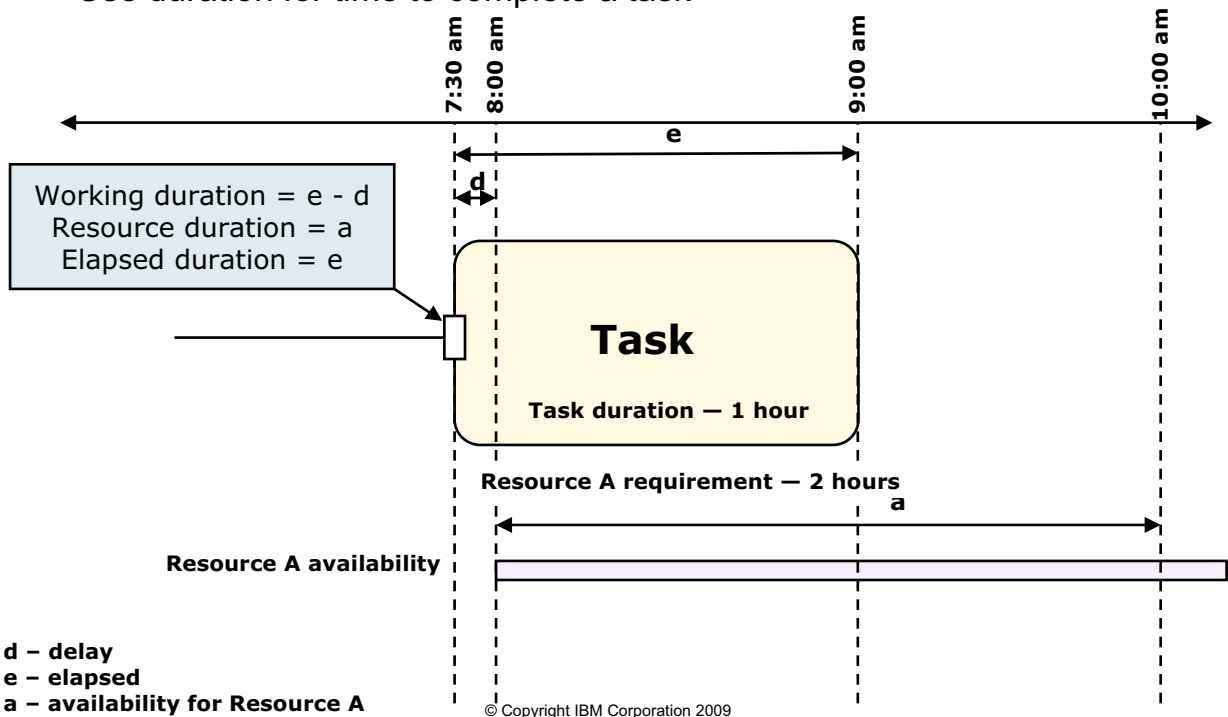
Figure 3-8. Single resource: task time equals set duration   WB286 / VB2861.0

Notes:

If the Task behavior with simulation preference set to "Yes," the task is held at one hour with a longer resource required time.

Multiple resources

- Task behavior with simulation preference set to "Yes"
  - Wait for resource end time to complete a task

Working duration = e - d
Resource duration = $\sum a_i + \sum b_i$
Elapsed duration = e

Task

Task duration — 1 hour

Resource A requirement — ½ hour

Resource A availability

Resource B requirement — 1 ½ hours

Resource B availability

d – delay
e – elapsed
a – availability for Resource A
b – availability for Resource B

© Copyright IBM Corporation 2009
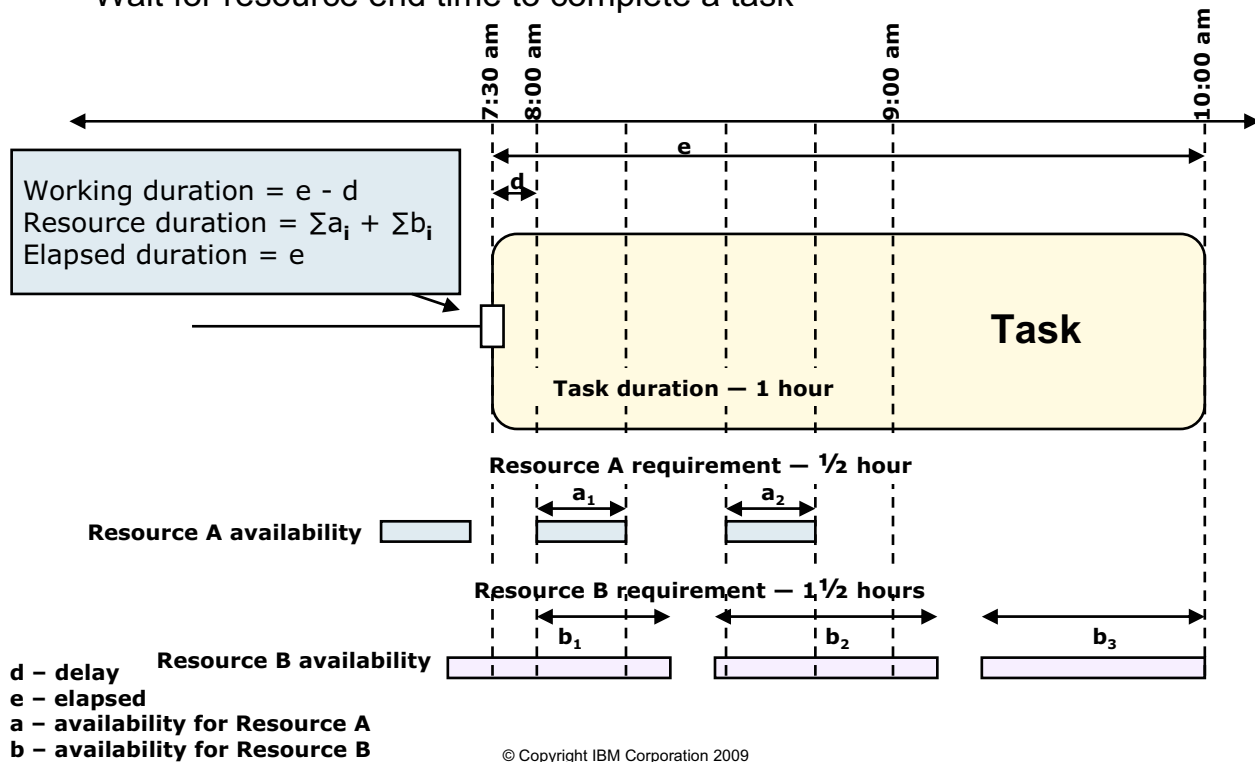
Figure 3-9. Multiple resources   WB286 / VB2861.0

Notes:

Resource A is available in 15-minute segments, for a total of one hour.

Resource B is available in 40-minute segments, for a total of one hour.

The total resource time is two hours, which is the time it takes to do the task.

Note that the total time to complete the task could be greater than two hours.

Creating a simulation snapshot

- To simulate a process, you must create a simulation snapshot.
  - Creating a simulation snapshot creates an initial simulation profile.
- The snapshot generator asks to check the terminate nodes.
  - Every process must end with a stop node.
- Fix critical errors before creating a snapshot.
- A new simulation snapshot appears in the Project Tree.
  - Its name is made up of:
    - The name of the originating process
    - The words "simulation snapshot"
    - A timestamp
  - The simulation snapshot contains the simulation snapshot settings and an initial simulation profile.
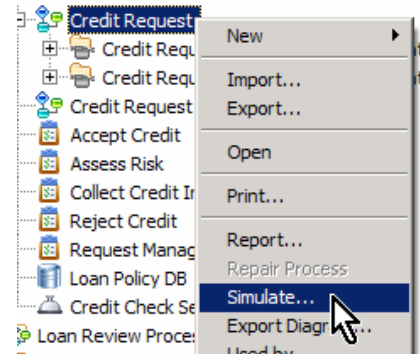
© Copyright IBM Corporation 2009

Figure 3-10. Creating a simulation snapshot

WB286 / VB2861.0

Notes:

Simulation snapshot (1 of 2)

- The
  simulation
  snapshot
  opens
  in the editor
  area.

- Snapshot
  name
  - Rename to
    indicate
    settings

- Simulation
  attributes
  - Define the
    simulation
    behavior
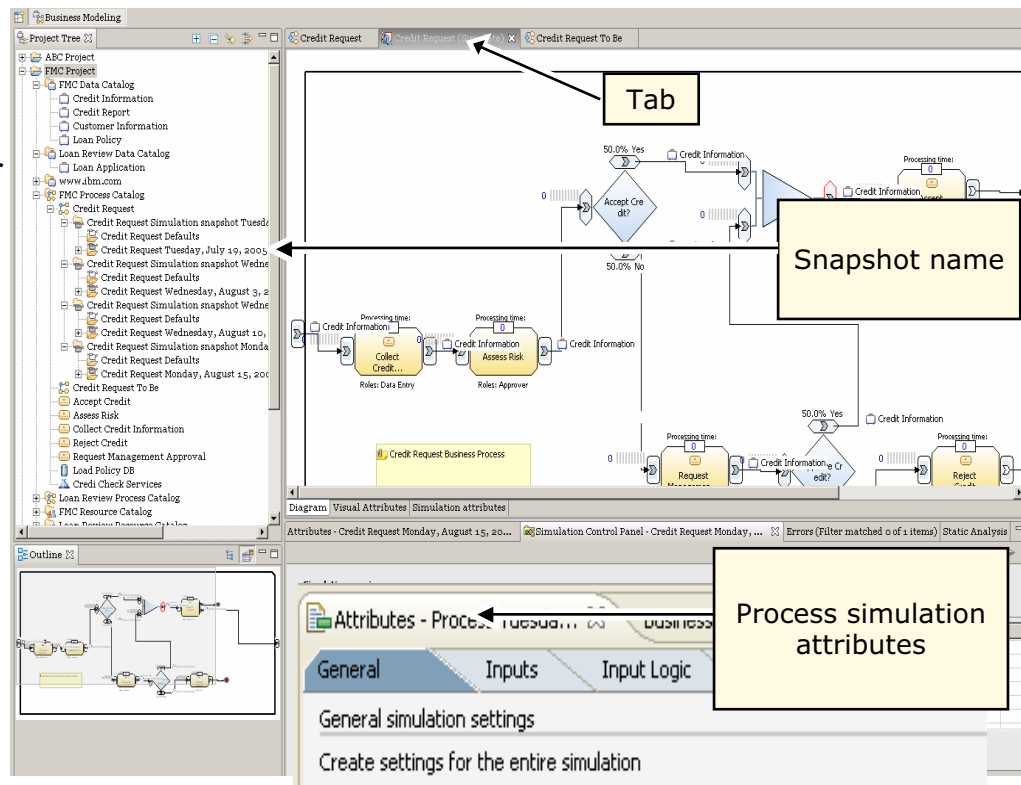
© Copyright IBM Corporation 2009

Figure 3-11. Simulation snapshot (1 of 2)   WB286 / VB2861.0

Notes:

Simulation snapshot (2 of 2)

- Token animation
  - Watch the movement of tokens
  - Look for bottlenecks
- Activity color
  - Changes color when active
- Instances
  - Displays number of instances
- Queue
  - Number of tokens waiting
  - Each bar represents two tokens
- Animation is not necessary
  - Turning off shortens execution time
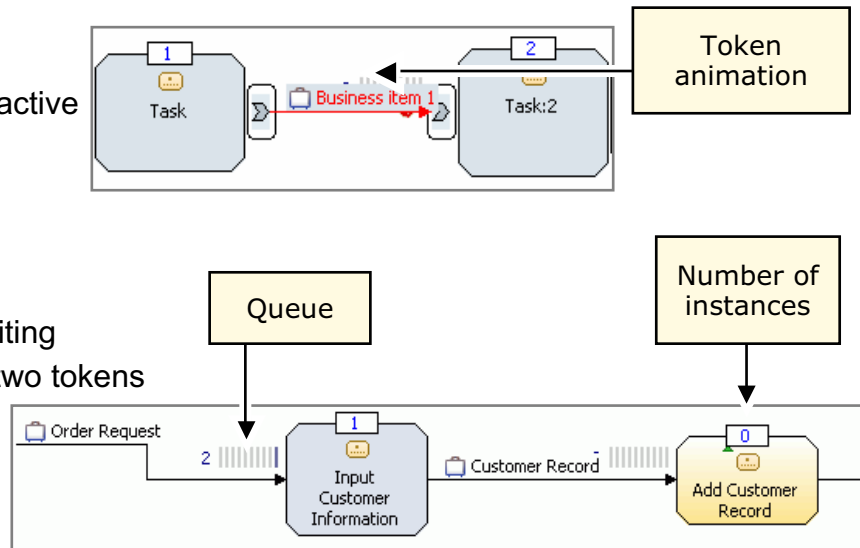
© Copyright IBM Corporation 2009

Figure 3-12. Simulation snapshot (2 of 2)   WB286 / VB2861.0

Notes:

Simulation attributes: General (1 of 2)

- Process availability begins and Process availability ends
- Evaluate subprocesses
- Maximum simulation duration
    - Real time in which the simulation occurs
- Maximum number of process invocations
    - Per simulation run

Overview	General	Inputs	Input Logic	Business Item Creation	Resource Pool	Interrupts

Create settings for the entire simulation

Process availability begins   Monday, January 5, 2009 9:00:00 AM GMT-8   Edit...

Process availability ends   Sunday, January 24, 2010 10:34:07 AM GMT-8   Edit...

Evaluate all subprocesses   ⦿ Yes   ○ No

Maximum simulation duration

Days	Hours	Minutes	Seconds	Milliseconds
365	0	0	0	0

Maximum number of process invocations   0

© Copyright IBM Corporation 2009

Figure 3-13. Simulation attributes: General (1 of 2)   WB286 / VB2861.0

Notes:

Specifying simulation snapshot settings for subprocess evaluation

Use this setting to specify whether or not subprocesses will be evaluated when you run simulations. Subprocesses that are not evaluated behave similarly to tasks, with fixed costs and durations.

Specifying simulation snapshot settings for the maximum simulation duration

This setting specifies the maximum amount of real-time that simulations will run.

Simulation attributes: General (2 of 2)

- Random number seed

- Delay for steady state simulation
  - Virtual wait time before collecting statistics
  - Skip data collection during startup

- Method of selecting output path

- Use resources' time required as task process time

© Copyright IBM Corporation 2009

Figure 3-14. Simulation attributes: General (2 of 2)   WB286 / VB2861.0

Notes:

Specifying simulation snapshot settings for the steady state simulation delay

This setting specifies the period that must elapse in the virtual time of a simulation run before statistics gathering commences.

Specifying simulation snapshot settings for selecting output paths

This setting determines the selection method that the simulation engine uses to choose between multiple paths when a process activity has more than one set of outputs defined by output criteria.

Randomly to a single path For each activity in the process that has multiple output criteria, the simulator randomly selects a single output criterion and generates outgoing tokens for each output defined in the selected output criterion.

Based on probabilities to a single path For each activity in the process that has multiple output criteria, the simulator makes a random selection (biased according to the

probabilities associated with each output criterion) of a single output criterion and generates outgoing tokens for each output defined in the selected output criterion.

Based on an expression For each activity in the process that has multiple output criteria, the simulator selects the first output criterion which either does not have a test expression or has a test expression which evaluates to true. Test expressions are currently used only by decision nodes. **Note:** Selecting this option enables all expressions throughout the process such as those defined for preconditions, postconditions, and correlations.

Specifying simulation snapshot settings for the random number seed

This setting defines a random number seed, which determines a fixed starting point for the sequence of random values that are used in a simulation.

Specifying simulation snapshot settings for using the resource time requirements for task duration

Use this setting to specify that processing durations for each activity in a process should always be equal to the resource requirement that has the longest duration for the activity.

Simulation attributes: Inputs (1 of 2)

- Associate a token with a business item
  - The business item will arrive with the token
- Number of tokens per bundle
  - Number of tokens that arrive at the same time
- Total number of tokens
  - Number of tokens generated per run
  - Total tokens are grouped by bundle
- One-time cost per token

Overview	General	Inputs	Input Logic	Business Item Creation	Resource Pool	Interrupts

Change the settings for creating tokens associated with inputs.

Name	Associated data	Minimum	Maximum	Input source
Input	Credit Information	1	1	Flow

Remove Token Creation Settings

Number of tokens per bundle

| 1 | Edit... |

Total number of tokens

| 5 | Edit... |

One-time cost per token

| 0 | Edit... | USD ▼ |

© Copyright IBM Corporation 2009

Figure 3-15. Simulation attributes: Inputs (1 of 2)   WB286 / VB2861.0

Notes:

Total number of tokens specify the total number of inputs that will be transmitted from the input. You can specify a specific value or, if you want to use a variable value, you can specify a distribution. If you want to use a distribution, refer to step 4 for details on available distribution types.

Number of tokens per bundle specify how many inputs will be bundled and transmitted together from the input. You can specify a specific value or, if you want to use a variable value, you can specify a distribution.

Simulation attributes: Inputs (2 of 2)

- Time trigger
  - Fixed interval with a start time
- Random time trigger
  - Select a statistical distribution for token generation
- Timetable trigger
  - Use a timetable to generate tokens

© Copyright IBM Corporation 2009

Figure 3-16. Simulation attributes: Inputs (2 of 2)   WB286 / VB2861.0

Notes:

Simulation attributes: Input logic

- Input criteria simulation settings:
  - For one process input: The probability of the input is 100%.
  - For multiple process inputs: Specify the probability of receiving each of the different inputs or combination of inputs.

© Copyright IBM Corporation 2009

Figure 3-17. Simulation attributes: Input logic   WB286 / VB2861.0

Notes:

Simulation attributes: Business item creation

- Business item creation
  - Specifies the business items to be created by the process
- Create simulation values
  - Specifies the rule used to create business items

| General | Inputs | Input Logic | Business Item Creation | Resource Pool | Interrupts |

Business item creation

Define how values are set on business items leaving this data input.

Name	Associated data	Minimum	Maximum	Output target
Input	Business item 1	1	1	Flow

Create Simulation Values

Simulation value creation

Select a rule type for business item creation in simulation.

Value creation rule

No Rule
No Rule
Random List
Weighted List
Define custom rules

© Copyright IBM Corporation 2009

Figure 3-18. Simulation attributes: Business item creation WB286 / VB2861.0

Notes:

Simulation attributes: Resource pool (1 of 2)

- Resource usage
  - Run simulation without resource requirements.
    - Ignore the resource requirements.
    - Use to test the model without resources.
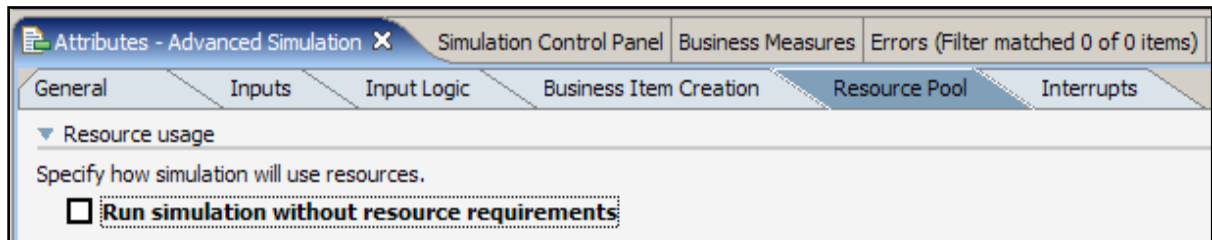
Figure 3-19. Simulation attributes: Resource pool (1 of 2)   WB286 / VB2861.0

Notes:

Specifying simulation snapshot settings for resource usage

Use this setting to cause simulations to ignore resource requirements altogether during a simulation.

Simulation attributes: Resource pool (2 of 2)

- Resource pool
  - Select resources to be made available to the simulation.
    - By default, all resources defined in your project are available.
    - If the roles are checked, the simulation will supply as many roles as needed.
    - The number of roles can be limited.
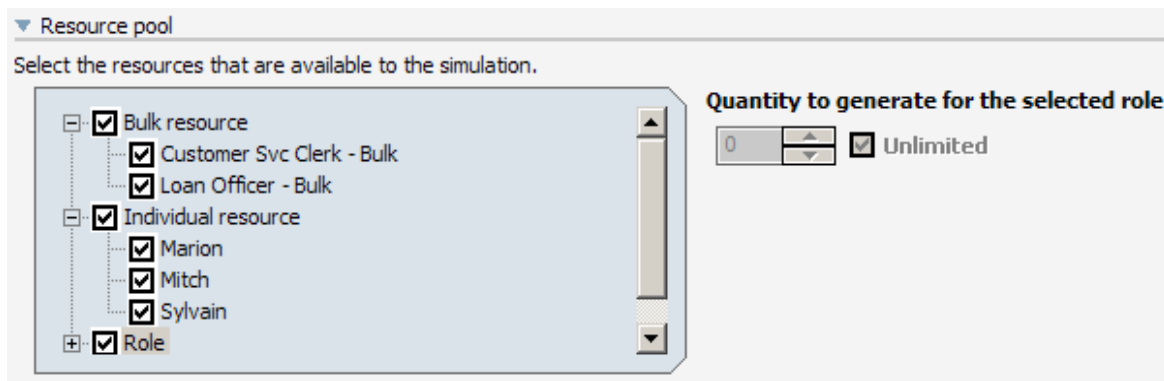
© Copyright IBM Corporation 2009

Figure 3-20. Simulation attributes: Resource pool (2 of 2)   WB286 / VB2861.0

Notes:

By specifying different resource allocations to a process that you simulate, you can determine the consequences of operating with fewer or more resources available. If you run multiple simulations with different levels of resource allocation, you can do a comparative analysis of the simulation results that reveals the effects of changing the resource allocations. You can also choose to ignore resource requirements altogether during a simulation.

Resource pool displays the resources for the process.

Select the resources that you want to make available to the process simulation. By default, all resources defined in your project are available. Optionally, specify a quantity of qualified resources to generate for each role required by the process. This enables you to examine the effects of adjusting the availability of qualified resources without actually creating individual resources that are qualified for the role.

Simulation attributes: Interrupts

- Interrupts allow the monitoring of specific conditions.
  - Cost overruns, excessive times spent waiting for resources.
    - The simulation run is automatically suspended when a condition occurs.

General	Inputs	Input Logic	Business Item Creation	Resource Pool	Interrupts

Simulation interrupt settings

Define the conditions that pause the simulation.

Available interrupt types

- ☐ Queue overflow
- ☐ Total idle time
- ☐ Total processing time
- ☐ Total cost
- ☐ Total deficit

Available settings for selected interrupt type

Interrupt setting	Value
Number of interrupt activations to ignore	
Check interrupt ratios	
Threshold (%)	

Interrupt type	Condition
Queue overflow	Total number of activities scheduled for completion at any given moment
Total idle time	Total time spent waiting for resources by all activities in the process
Total processing time	Total processing time of all activities in the process
Total cost	Total cost of performing all activities within a process **Note:** This does not consider revenue generated by activities
Total deficit	Total cost minus revenue of all activities performed within a process

© Copyright IBM Corporation 2009

Figure 3-21. Simulation attributes: Interrupts   WB286 / VB2861.0

Notes:

Simulation control panel

- The simulation control panel
  - Controls simulation settings and allows you to pause, stop, step, run a simulation
  - Shows time the simulation has been running
  - Shows data updated as model is running
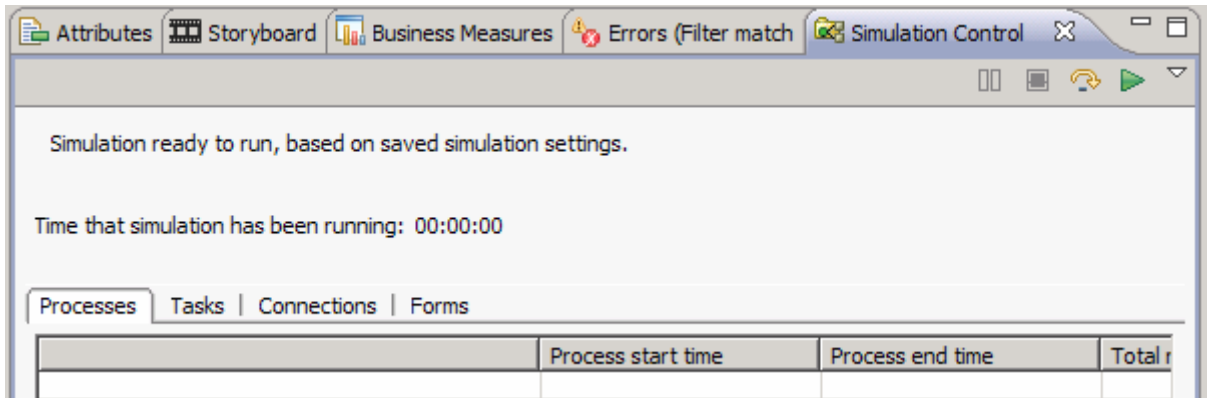
© Copyright IBM Corporation 2009

Figure 3-22. Simulation control panel WB286 / VB2861.0

Notes:

Simulation settings

- Simulation settings
  - Step settings
  - Animation settings
    - Display animation
    - Speed
  - Statistic settings
    - Specify what is displayed in statistics
  - Replication settings
  - Result settings

© Copyright IBM Corporation 2009

Figure 3-23. Simulation settings   WB286 / VB2861.0

Notes:

Simulation statistics

- Displayed in a tab over the attributes
  - Processes, tasks and connections
  - Check box — collect and display statistics across process instances
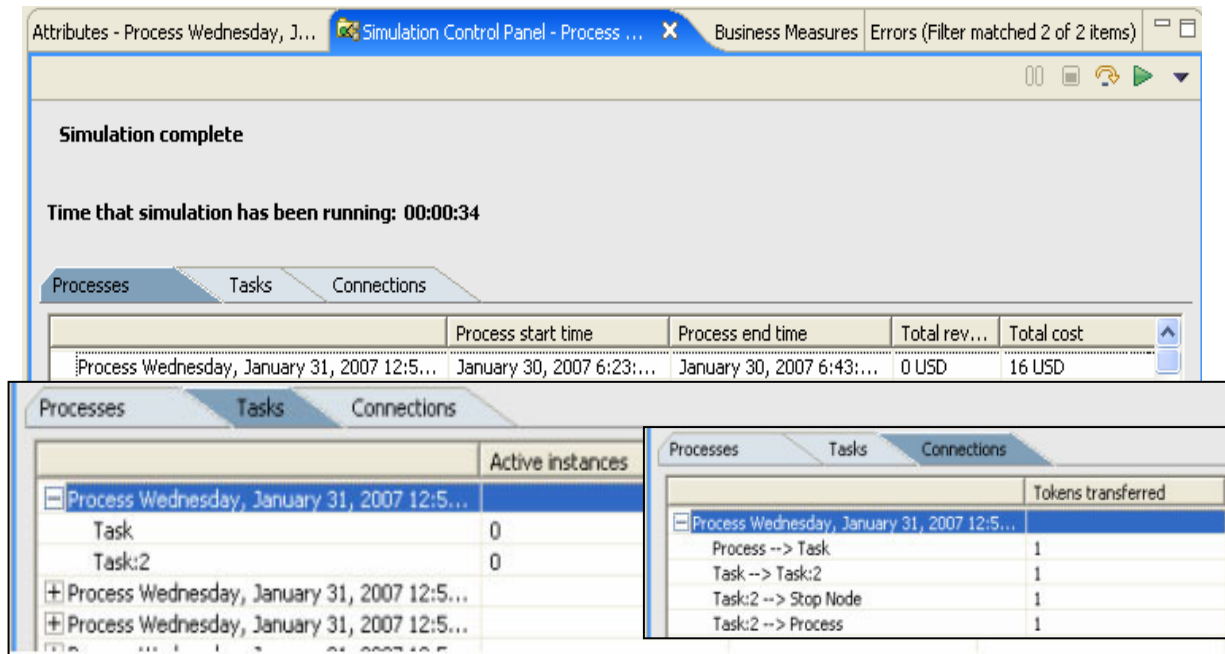
© Copyright IBM Corporation 2009

Figure 3-24. Simulation statistics   WB286 / VB2861.0

Notes:

Under **Statistic settings**, select **Display statistics during simulation** if you want to see the statistics generated by the process as the tool simulates it. Otherwise, the simulation runs and produces simulation results that you can use for dynamic analysis, but does not show simulation statistics in the control panel. If you select this option, you can also specify which elements to display in the statistics in the following manner:

- Select **Collect statistics for each process instance** if you want to see statistics for each generated process instance. If you select this option, you can also enable or disable statistics gathering for processes, tasks, and connections by selecting or clearing the following check boxes:

  - **Show process statistics**
  - **Show task statistics**
  - **Show connection statistics**

- Select a value for **Maximum process instances to display**.

• Select **Collect and average statistics across process instances** if you want to enable viewing generated statistics as averages for all process instances. **Note:** If you want to display generated statistics as averages, you must enable this option and also select **Collect and display statistics across process instances** on the control panel.

Simulation errors

- Simulation finished but not all tasks were completed successfully (includes details).
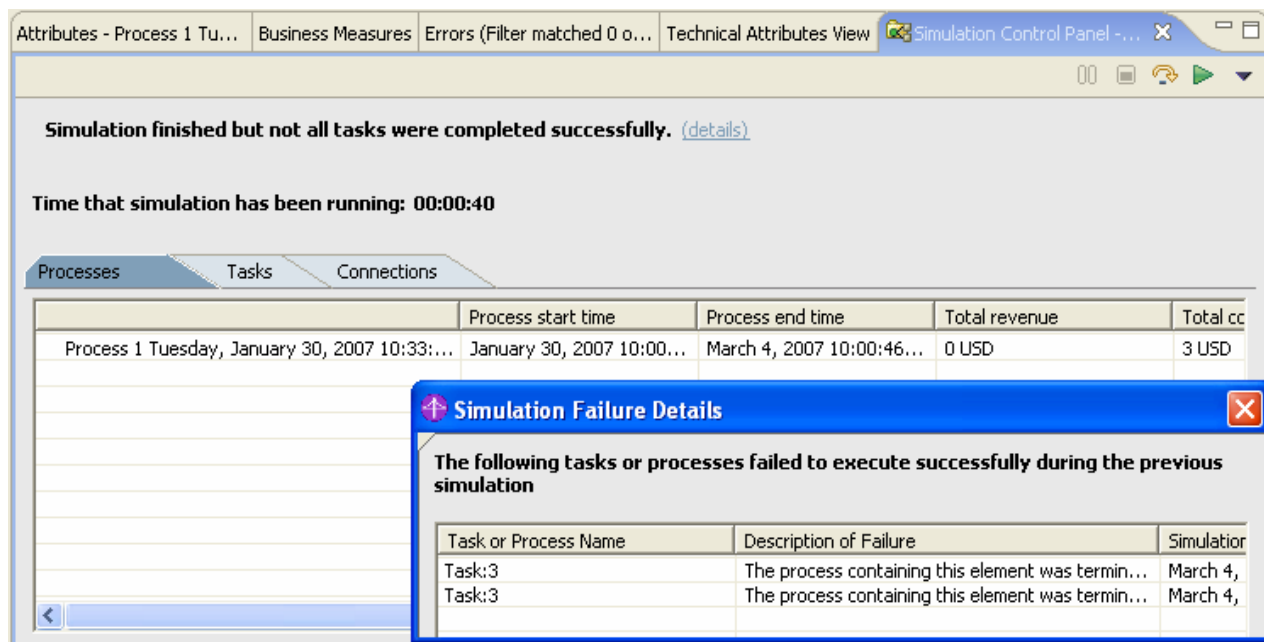
© Copyright IBM Corporation 2009

Figure 3-25. Simulation errors   WB286 / VB2861.0

Notes:

You receive a message saying that there are not enough resources available to complete the simulation.

If a simulation stops and you receive a message saying that there were not enough resources available to complete the simulation, the message is referring to the modeled resource within the simulation, not to a problem with the computer system. You need more resources available for the process. The following are situations that can cause this error:

- A task requires two field technicians but only one is available for the process.
- A task requires a field technician on Monday, and can wait for two days until Wednesday, but the field technician is not available until Friday.
- Roles are assigned to tasks, but there are not enough resources available to fulfill the role requirements.

Simulation results

© Copyright IBM Corporation 2009

Figure 3-26. Simulation results   WB286 / VB2861.0

Notes:

Changing model attributes in the simulation model
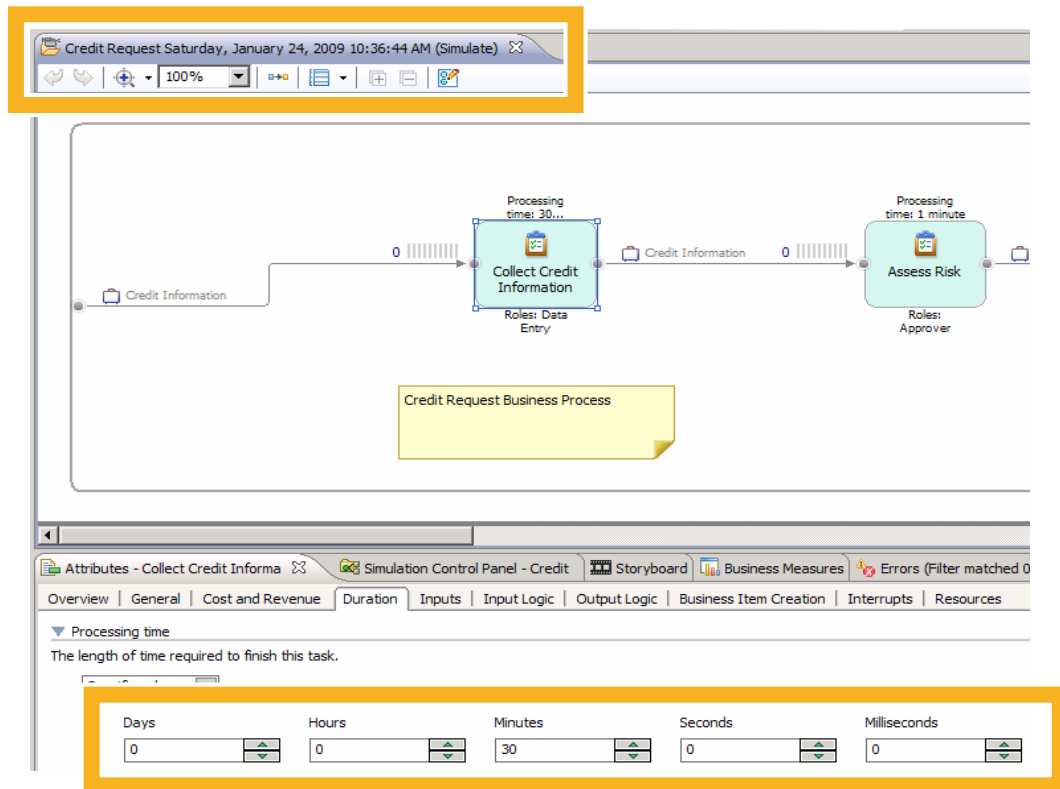
© Copyright IBM Corporation 2009

Figure 3-27. Changing model attributes in the simulation model WB286 / VB2861.0

Notes:

Setting simulation preferences

- Simulation attributes control the behavior of your simulation runs so that simulation snapshots and results reflect real-world behavior.

- Simulation attributes can be set at multiple levels.
  - At the highest level are the simulation preferences.
  - At the next level are the simulation snapshot settings.
  - At the lowest level are those in a particular simulation profile.

Figure 3-28. Setting simulation preferences   WB286 / VB2861.0

Notes:

Simulation attributes can be set at multiple levels.

- At the highest level are the simulation preferences.

  - Set through the preferences window

  - Used as default values for new simulation snapshots and profiles

- At the next level are the simulation snapshot settings.

  - Subset of the attributes available in the preferences

  - Initial values are taken from the preferences

  - Override these values by editing the "snapshot defaults"

- At the lowest level are those in a particular simulation profile.

  - Initial values are taken from a combination of the simulation preferences and simulation snapshot settings.

  - Override the values in the simulation attribute tabs.

- **-** The settings in the simulation profile are used for simulation and analysis.

Simulation preferences

- At the highest level are the simulation preferences.
  - From the tool bar:
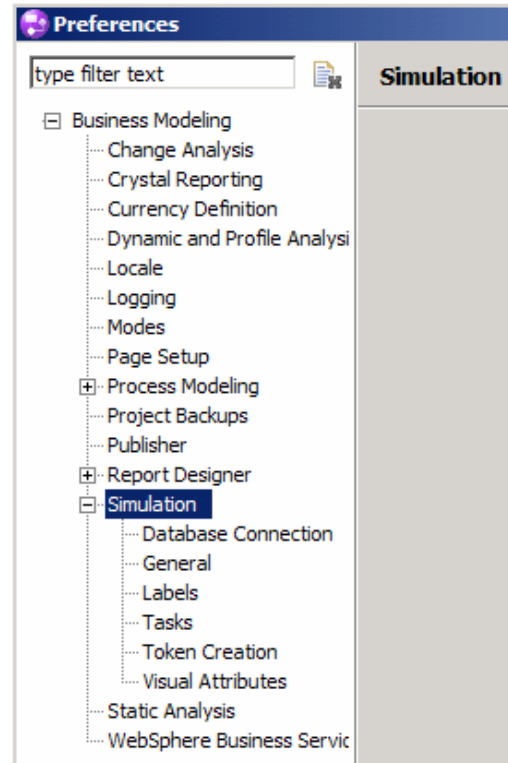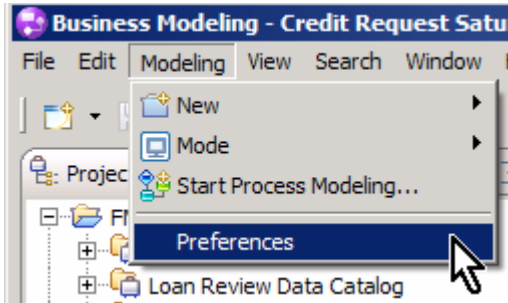
© Copyright IBM Corporation 2009

Figure 3-29. Simulation preferences WB286 / VB2861.0

Notes:

Simulation preferences: database connection, general, labels

© Copyright IBM Corporation 2009
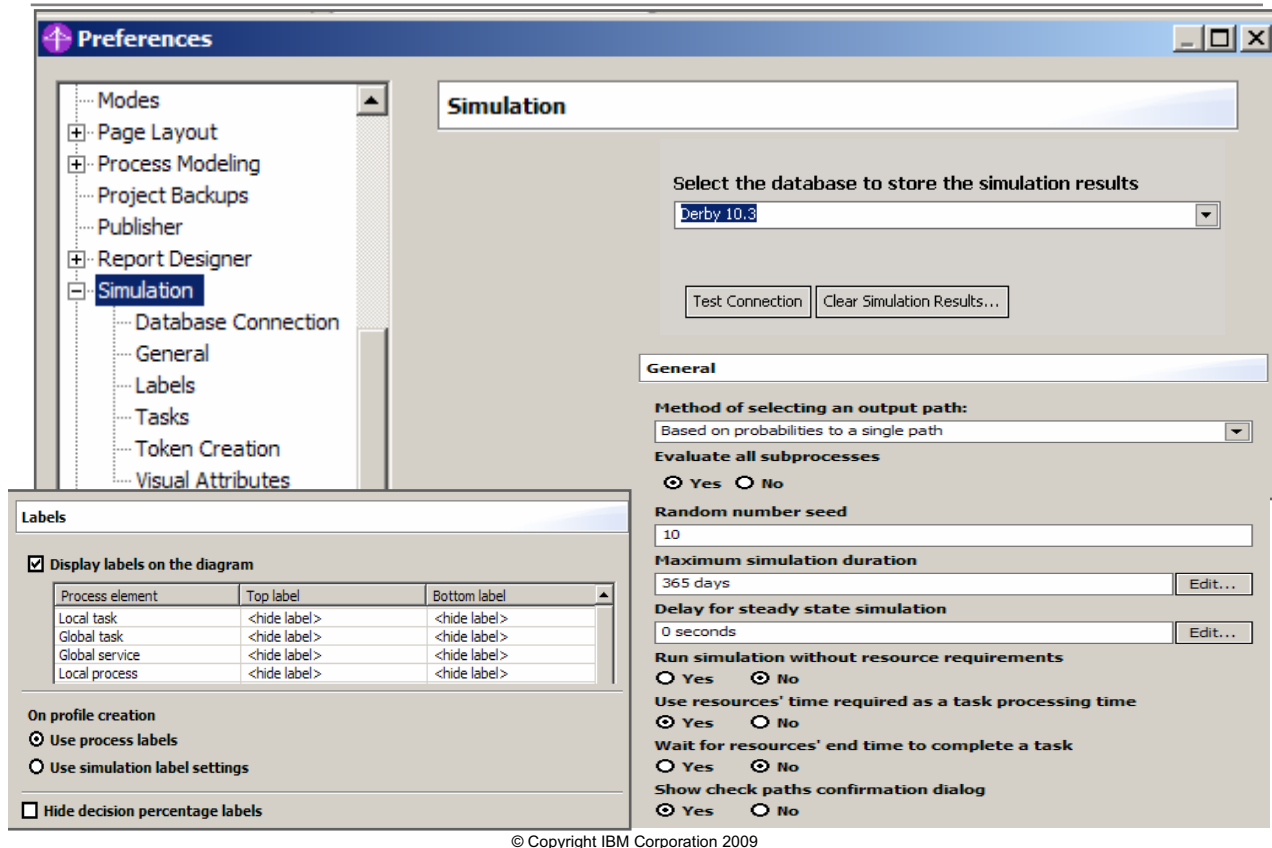
Figure 3-30. Simulation preferences: database connection, general, labels   WB286 / VB2861.0

Notes:

Simulation preferences: tasks, token creation, visual attributes
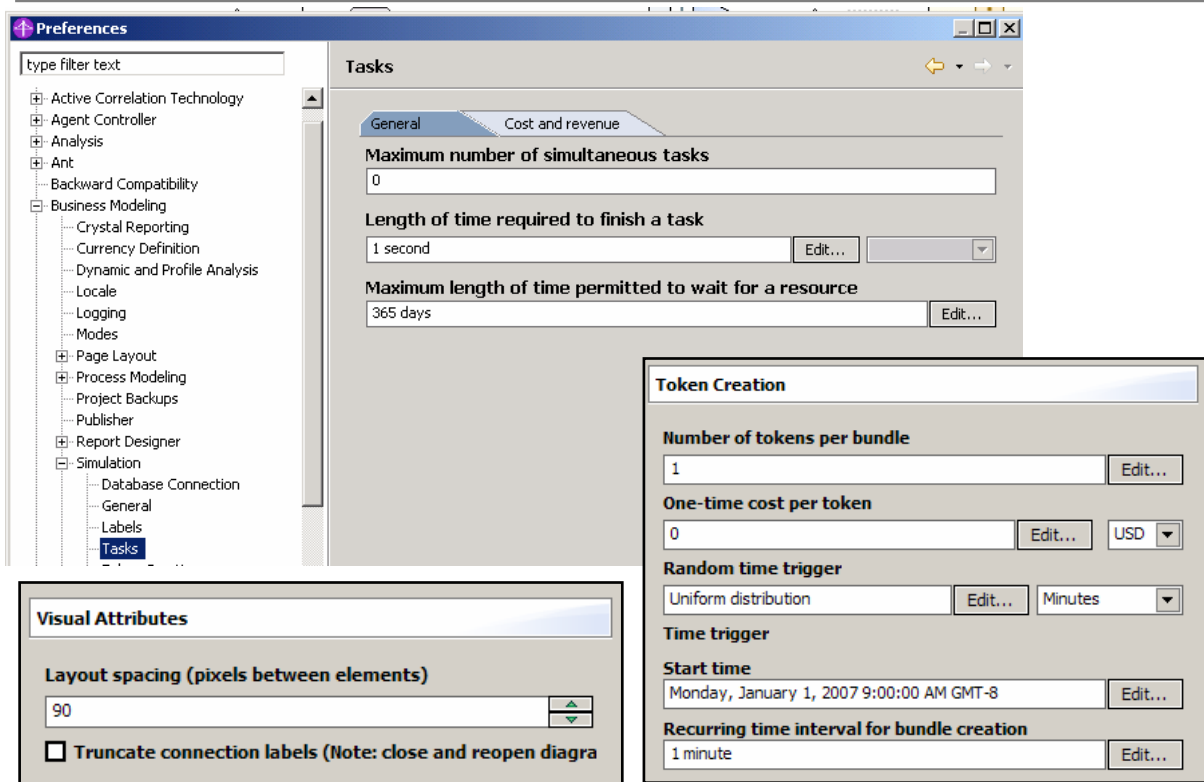
© Copyright IBM Corporation 2009

Figure 3-31. Simulation preferences: tasks, token creation, visual attributes WB286 / VB2861.0

Notes:

Simulation snapshot settings (1 of 2)
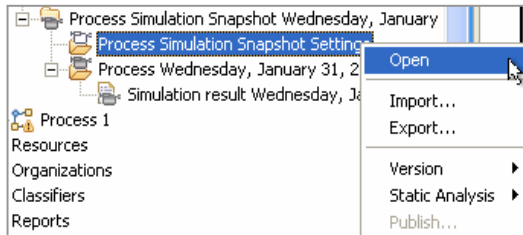
- Next level from the Project Tree
- Includes general settings, token creation settings, and tasks settings
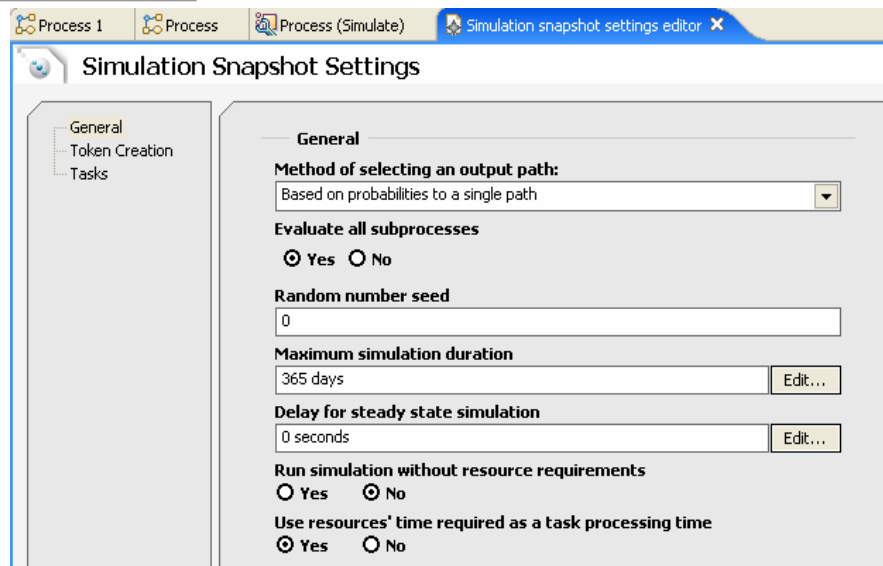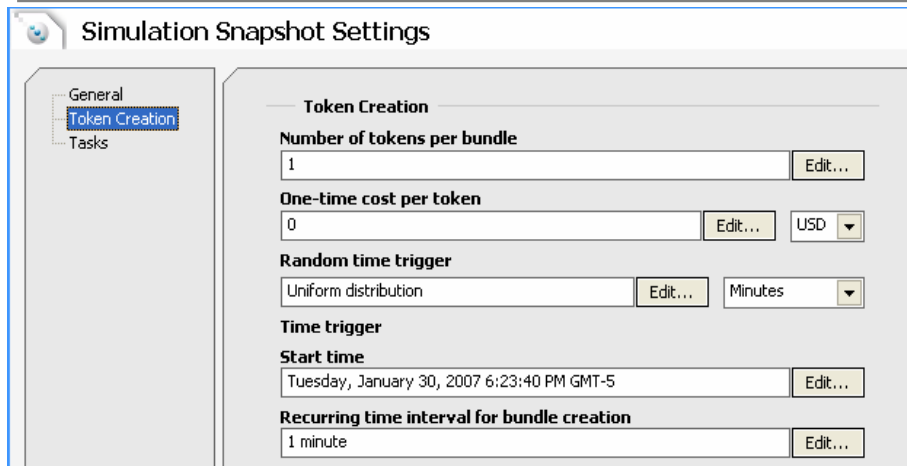
© Copyright IBM Corporation 2009

Figure 3-32. Simulation snapshot settings (1 of 2)   WB286 / VB2861.0

Notes:
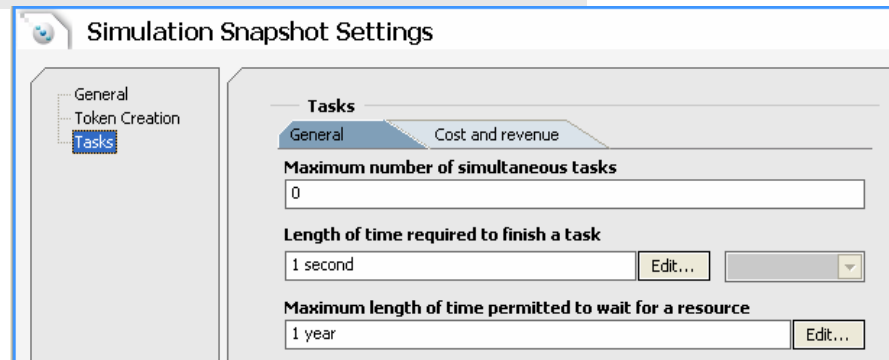
Simulation snapshot settings (2 of 2)

- Token creation and tasks settings

© Copyright IBM Corporation 2009

Figure 3-33. Simulation snapshot settings (2 of 2)   WB286 / VB2861.0

Notes:

Simulating human tasks with forms

- Allow user to interactively simulate business processes and perform more realistic data driven simulations
- Simulate the completion of human tasks that involve forms interactions
- During the simulation run, user are prompted to complete any forms required by the human tasks in the process
- User input data will be used to populate the business items passed on to subsequent tasks and decisions in the process flow
- The data entered will influence the execution path of the process
- The process must have at least one human task that has a form associated with it.
- **Enable Form simulation** must be selected.
- The simulation must be data-driven and the **Method for selecting an output path** preference must be set to **Based on an expression**.
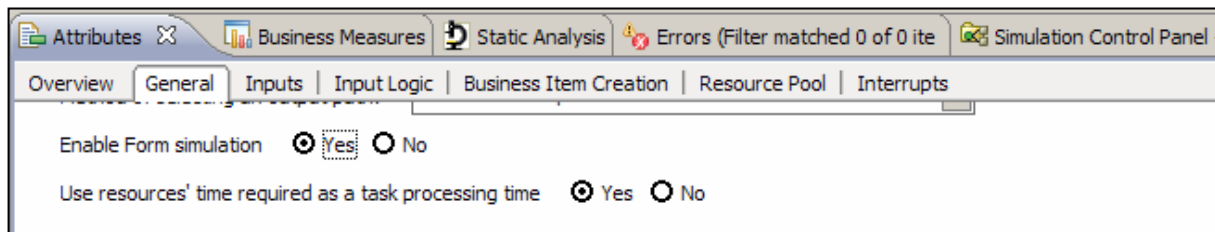
© Copyright IBM Corporation 2009

Figure 3-34. Simulating human tasks with forms   WB286 / VB2861.0

Notes:

 In order to enable forms interaction during simulation, the following criteria must be met:

You must have Lotus Forms Viewer Version 3.0.1 installed.

Lotus Forms Viewer is launched with an Eclipse-embedded browser using Internet Explorer on Windows. The browsers recommended for use with Lotus Forms Viewer are as follows:

- Microsoft Internet Explorer 6.0 Service pack 1, on the Microsoft Windows 2000 Service pack 4

- Microsoft Internet Explorer 6.0 or Microsoft Internet Explorer 7 for Microsoft Windows XP Service pack 2

- Microsoft Internet Explorer 7 on Windows Vista

Checkpoint

1. What is the difference between task duration and resource time requirements?

   _____

2. What is the function of a resource pool during simulation?

   _____

3. When is the purpose of an interrupt?

   _____

4. How do you turn off the animation during a simulation so that it runs more quickly?

   _____

Figure 3-35. Checkpoint WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

3.

4.

Unit summary

Having completed this unit, you should be able to:
- Describe element behavior in simulations
- Create a snapshot
- Define simulation attributes
- Define simulation preferences

Figure 3-36. Unit summary WB286 / VB2861.0

Notes:

Checkpoint solution

1. What is the difference between task duration and resource time requirements?
   Task duration is used to determine cycle time.
   Resource time requirements are used to calculate cost
2. What is the function of a resource pool during simulation?
   The resource pool allows the selected resources to be made available to the simulation
3. When is the purpose of an interrupt?
   Interrupts allow the monitoring of specific conditions such as cost overruns or excessive time spent waiting for resources. The simulation run is automatically suspended when a condition occurs
4. How do you turn off the animation during a simulation so that it runs more quickly?
   In Simulation Settings, clear the "Display Animation during simulation" check box

Figure 3-37. Checkpoint solution   WB286 / VB2861.0

Notes:

Exercise overview

In this exercise, you will:
• Run a process simulation
• Use global simulation settings
• Run a simulation with global simulation attributes
• Use local simulation attributes
• Run a simulation with local simulation attributes
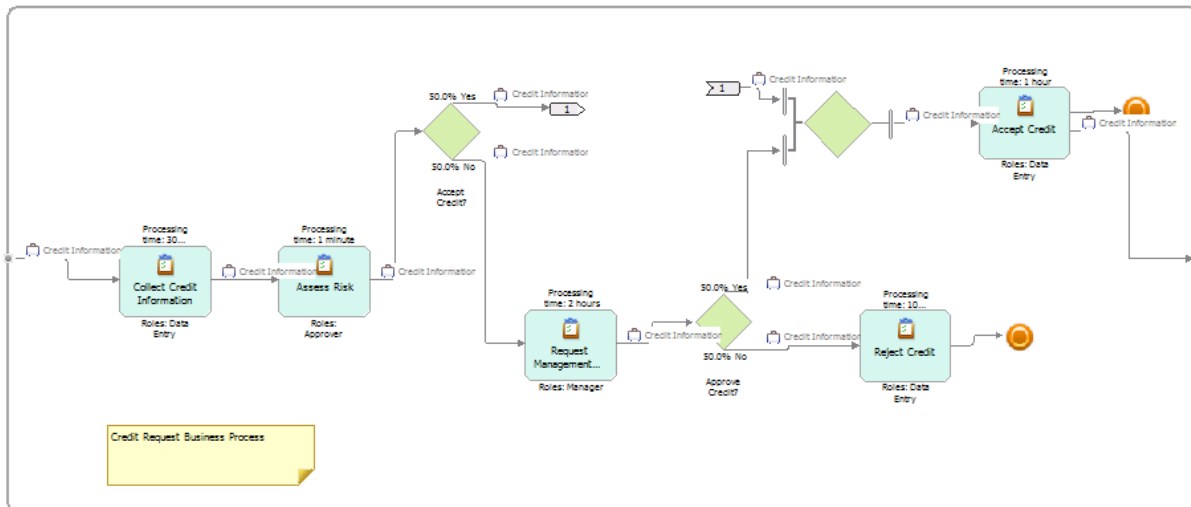
© Copyright IBM Corporation 2009

Figure 3-38. Exercise overview WB286 / VB2861.0

Notes:

Unit 4. Profile and dynamic analysis

What this unit is about

This unit describes the profile and dynamic analysis.

What you should be able to do

After completing this unit, you should be able to:

- Conduct profile analysis using profile specification and case summary
- Conduct dynamic analysis from simulation results

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
- Conduct profile analysis using profile specification and case summary
- Conduct dynamic analysis from simulation results

© Copyright IBM Corporation 2009

Figure 4-1. Unit objectives   WB286 / VB2861.0

Notes:

Analyzing simulation data in Modeler
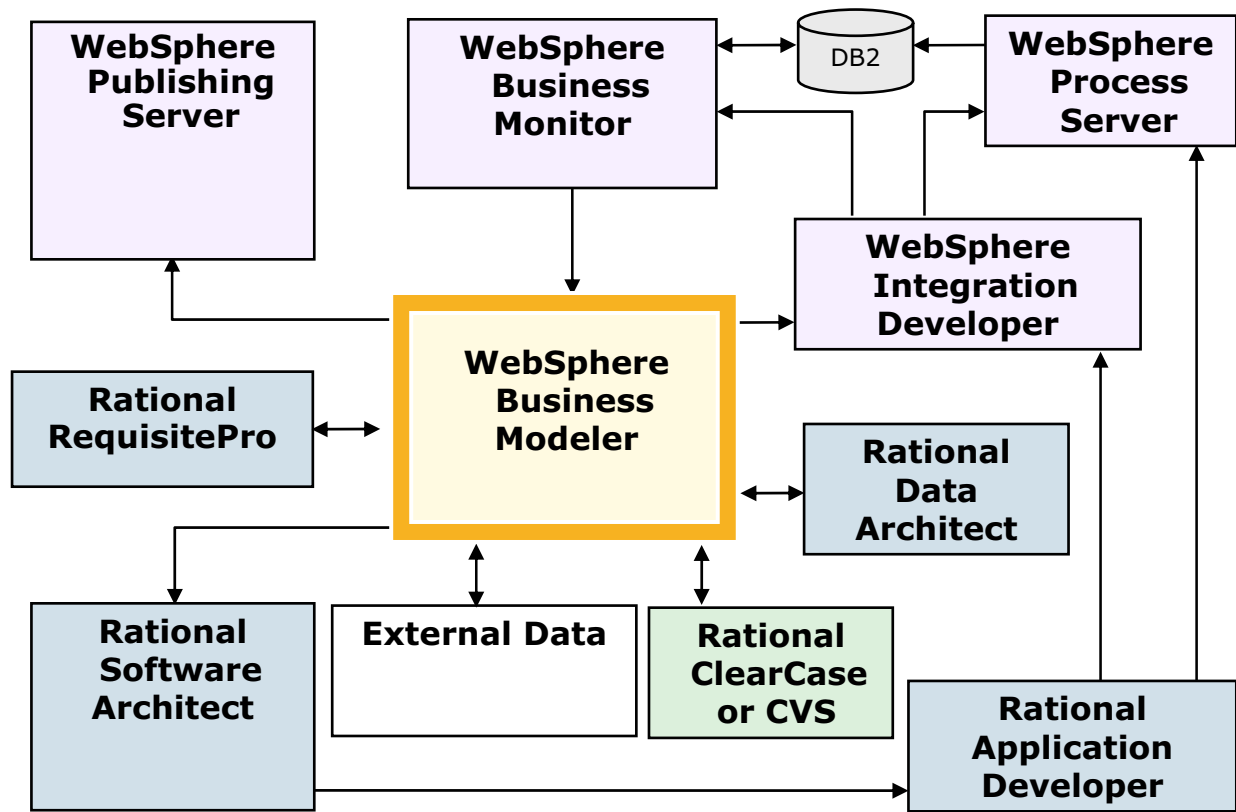
© Copyright IBM Corporation 2009

Figure 4-2. Analyzing simulation data in Modeler   WB286 / VB2861.0

Notes:

Analyzing process simulation profiles

- Profile analysis is performed on process simulation profiles before simulations are run.
  - A simulation profile must be created before conducting the analysis.
  - Profile specification.
    - Shows the simulation settings for each of the activities in a simulation profile
  - Static process cases summary:
    - Shows summary information describing each of the process cases (paths) through the process recorded by the simulation profile
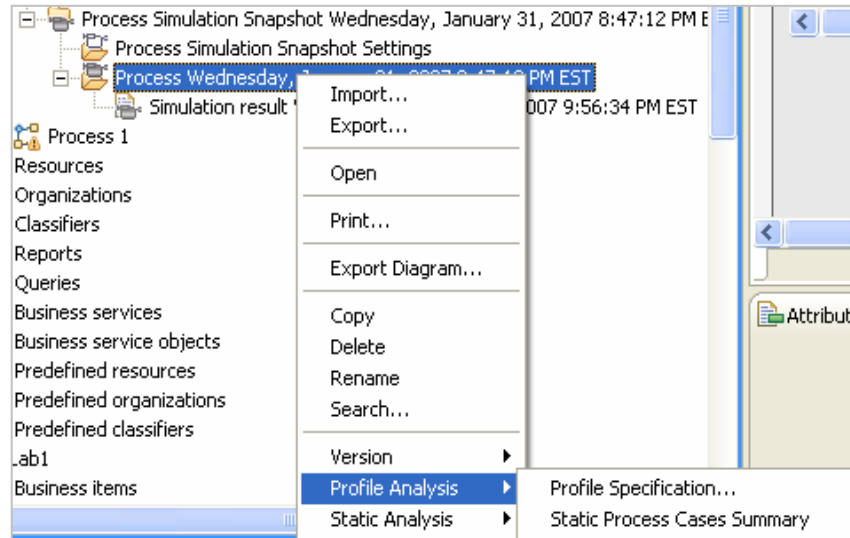
© Copyright IBM Corporation 2009

Figure 4-3. Analyzing process simulation profiles   WB286 / VB2861.0

Notes:

Profile specification

- Specification provides a way of reviewing, documenting, and validating values that are used during a simulation run.
- This analysis reports seven different types of activities:
  - Decisions, loops, tasks, global tasks, services, subprocesses, and global processes
- Analysis attributes can be customized by activity type.

Profile Specification | Process Friday, February 2, 2007 1:22:17 PM EST | 1:22 PM				
Activity Name	Activity Duration	Requirement Type	Resource or Role ...	Requirement Duration
⊟ Decision				

Quantity	Quantity Unit	Classifier	Classifier Value	Input Name	Associated Input Data

Output Name	Associated Output Data	Input/Output Criterion Name	Distribution	Processing Cost

Wait-time Cost	Wait-time Cost Time Unit	Revenue
USD0.00	1 second	USD0.00

Activity rows: ⊟ Task, ⊟ Task:2, Output — Business item 1, ⊟ Task:3

© Copyright IBM Corporation 2009

Figure 4-4. Profile specification   WB286 / VB2861.0

Notes:

Static process cases summary

- A static case summary shows each of the process cases (paths).
- The model cannot contain the following elements, which keep Modeler from determining a finite set of process cases:
  - Repositories, notification broadcasters, notification receivers, observers, and timers
    - The presence of these elements causes an error during analysis.
- Provides a comprehensive description of the possible paths
  - Including the costs and revenue generated by each possible path
  - Includes the expected relative frequencies of each path
- Results for this analysis use several assumptions and limitations

Static Process Cases Summary | Process Friday, February 2, 2007 1:22:17 PM EST | 2:26 PM

Case Name	Activity Name	Cost	Revenue	Run Cost	Resource Cost	Profit	Elapsed Duration	Working Duration	Resource Duration	Distribution
⊟ Case 1		U…	USD0.00	USD16…	USD0.00	(U…	20 minutes	20 minutes	0 seconds	50.00%
	Decision	U…	USD0.00	USD0.00	USD0.00	US…	0 seconds	0 seconds	0 seconds	
	Task	U…	USD0.00	USD5.00	USD0.00	(U…	6 minutes	6 minutes	0 seconds	
	Task:2	U…	USD0.00	USD11…	USD0.00	(U…	14 minutes	14 minutes	0 seconds	
⊟ Case 2		U…	USD0.00	USD5.00	USD0.00	(U…	6 minutes 1 se…	6 minutes 1 se…	0 seconds	50.00%
	Decision	U…	USD0.00	USD0.00	USD0.00	US…	0 seconds	0 seconds	0 seconds	
	Task	U…	USD0.00	USD5.00	USD0.00	(U…	6 minutes	6 minutes	0 seconds	
	Task:3	U…	USD0.00	USD0.00	USD0.00	US…	1 second	1 second	0 seconds	
All Cases		U…	USD0.00	USD10…	USD0.00	(U…	13 minutes 0.…	13 minutes 0.5…	0 seconds	

© Copyright IBM Corporation 2009

Figure 4-5. Static process cases summary   WB286 / VB2861.0

Notes:

Dynamic analysis

- Dynamic analysis shows the results of a process simulation from different perspectives:
  - Time, money, and statistics
- Analysis can be performed at three levels of granularity:
  - Aggregated analysis
    - Uses all the data from the entire simulation
  - Process cases analysis
    - Uses data from specific cases
  - Process instance analysis
    - Uses data from a specific instance of a process case
- Comparative analysis
  - Compares two simulation runs
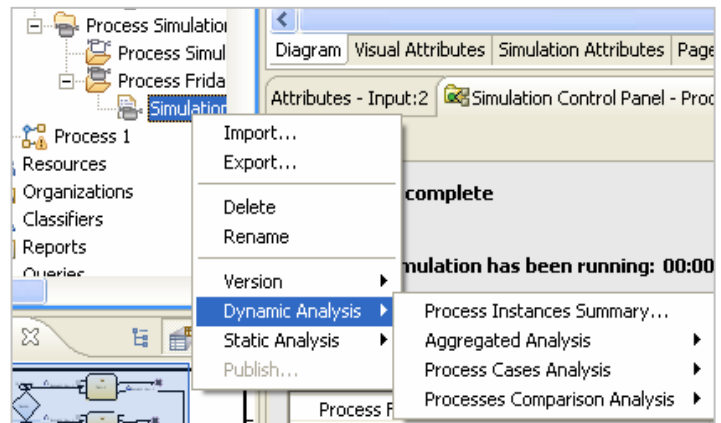
© Copyright IBM Corporation 2009

Figure 4-6. Dynamic analysis   WB286 / VB2861.0

Notes:

Analyzing simulation data

- A simulation provides a wealth of data, but without detailed analysis, that data is limited in its usefulness.
  - To get the most out of simulation data, dynamic analysis needs to be performed on the results.
  - Extract information regarding scheduling, costs, output, and other statistics pertaining to your processes.
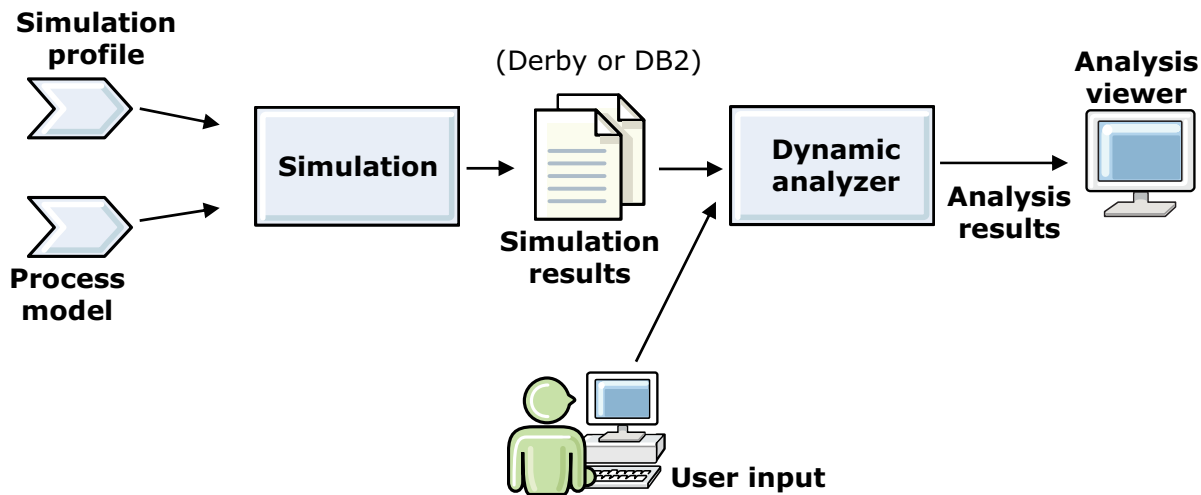
© Copyright IBM Corporation 2009

Figure 4-7. Analyzing simulation data WB286 / VB2861.0

Notes:

Aggregated analysis (1)

- Used to gain an understanding of the behavior of the process as a whole
  - Most broadly scoped of the dynamic analyses
    - Uses all the data from the entire simulation run

- Determines information about activities and resources used in all process instances generated during a simulation
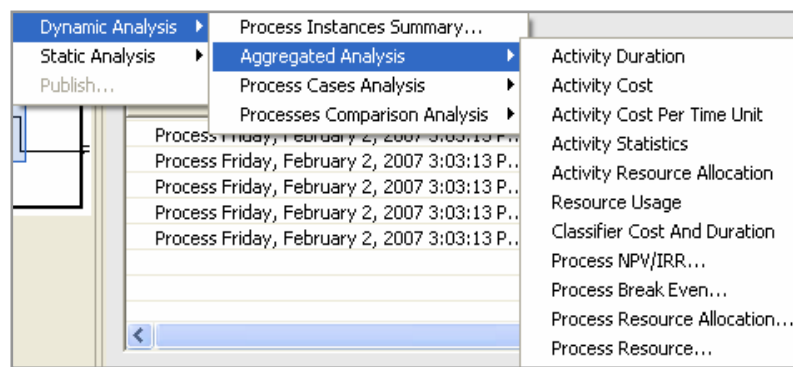
© Copyright IBM Corporation 2009

Figure 4-8. Aggregated analysis (1)   WB286 / VB2861.0

Notes:

Aggregated analysis (2)

- Analyzing activity durations
  - Shows the average time it takes for each activity to complete
  - Indicates time taken waiting for resources to be available

- Analyzing activity costs
  - Understand the costs incurred by the activities

- Analyzing activity cost per time unit
  - Compute the average rate of cost of each activity

- Analyzing activity statistics
  - Information on the successful completion of the process activities

- Analyzing activity resource allocations
  - Summary of the resources allocated to each activity
  - Resources allocated and the average allocation time, cost, and shortages for each resource

© Copyright IBM Corporation 2009

Figure 4-9. Aggregated analysis (2)   WB286 / VB2861.0

Notes:

Aggregated analysis (3)

- Analyzing resource usage
    - Activities that each resource was allocated to
    - Information about time, cost, and shortage durations
    - Detailed information about every allocation of the resource

- Analyzing classifier cost and duration
    - Information regarding the average cost and duration of an entire classification of activities within the process.

- Analyzing net present value and internal rate of return
    - Current net present value of a process
        - Need to provide an initial cost, a discount rate, and a payback period
        - Internal rate of return necessary to produce a net present value of zero by the end of the payback period

Figure 4-10. Aggregated analysis (3) WB286 / VB2861.0

Notes:

Aggregated analysis (4)

- Analyzing the break-even point
  - Number of times a process must run to generate enough profit to recover a specified fixed cost
    - Value is based on the average costs and revenue for the process as a whole.

- Analyzing process resource allocations
  - How each activity uses its resources to help identify resource shortages
  - How the resources required by an activity contribute to the cost

- Analyzing process resources
  - List of the resources used by the process
  - Average allocations of the resources

Figure 4-11. Aggregated analysis (4)   WB286 / VB2861.0

Notes:

Process cases analysis (1)

- Used to gain an understanding of a specific case (process flow) within the process

- Shows weighted average values, where the average value is weighted for each process case to account for the distribution of process instances to that case relative to other cases

- Organizes and averages the simulation results generated for each process case, which enables you to investigate variations in performance between different patterns of process flow
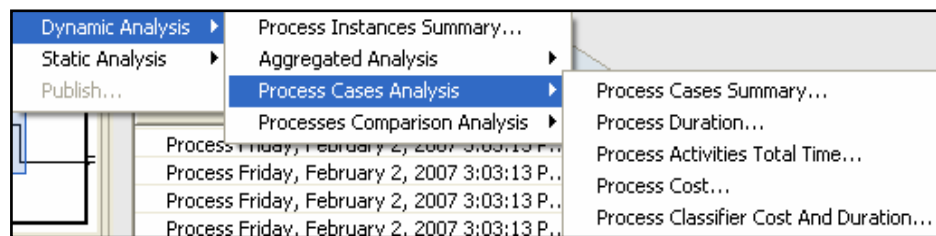
© Copyright IBM Corporation 2009

Figure 4-12. Process cases analysis (1)   WB286 / VB2861.0

Notes:

Process cases analysis (2)

- Analyzing process cases summaries
  - Display summary information for each of the process cases produced during a simulation

- Analyzing process durations
  - Examine the average durations of all process cases

- Analyzing process activities total times
  - Determine the average total time values for all process instances

- Analyzing process costs
  - Examine the average costs, revenues, and profits for all process instances

- Analyzing classifier costs and durations
  - Show the costs and durations of activities associated with each classifier value used in a process

Figure 4-13. Process cases analysis (2)   WB286 / VB2861.0

Notes:

Process instance analysis (1)

- Process instance analysis is used to gain an understanding of the behavior of a specific token's run through the process.
  - Get a detailed understanding of each individual pass through a process during simulation
- Process instance analyses are the most granular of the dynamic analyses.
  - Use data from a single instance of a process case

© Copyright IBM Corporation 2009
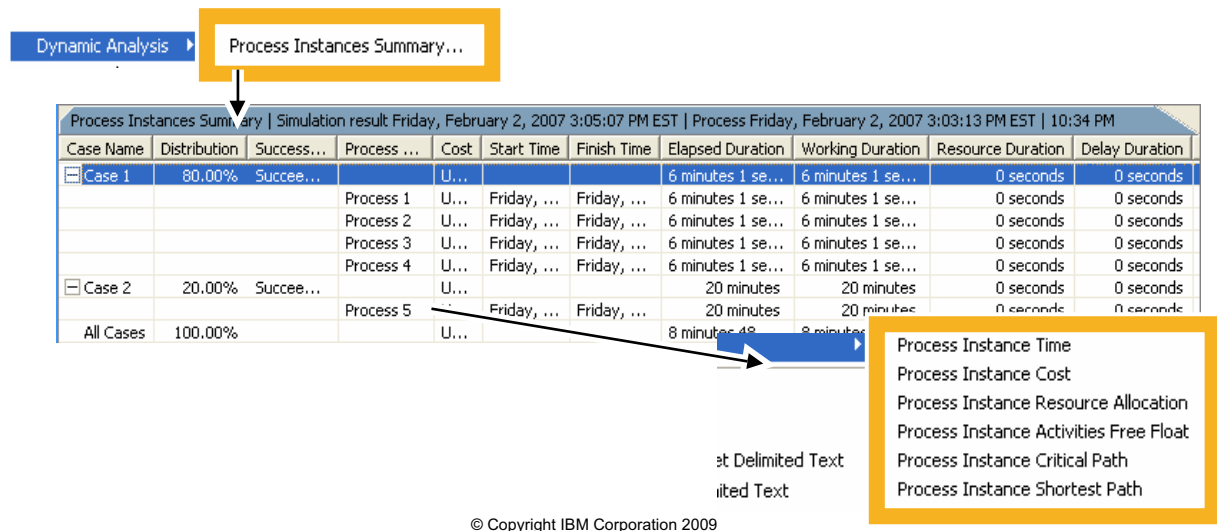
Figure 4-14. Process instance analysis (1)   WB286 / VB2861.0

Notes:

Process instance analysis (2)

- Analyzing process instance times
    - Display the durations of each of the activities involved in a process instance
- Analyzing process instance costs
    - Display detailed information about the cost and revenue for each activity within a process instance
- Analyzing process instance resource allocation
    - Obtain detailed information about the resources allocated to activities in a process instance
- Analyzing process instance activities free float
    - Display information about the available free float (slack time) periods associated with activities in a process instance
- Analyzing process instance critical paths
    - Display the path of longest duration within the process instance
- Analyzing process instance shortest paths
    - Display the path in a process instance that has the shortest duration of all parallel paths

Figure 4-15. Process instance analysis (2)   WB286 / VB2861.0

Notes:

Processes comparison analysis (1)

- Used to highlight differences and similarities in simulation results between two different simulation runs
  - Different versions of a modeled process
  - Different simulation sizes
  - Different decision probabilities

- Compares the weighted average analysis results for two simulated processes that use the same input parameters
  - For example, compare the average length of time it takes to complete your current process versus your proposed future process.

Dynamic Analysis ▶	Process Instances Summary…	
Static Analysis ▶	Aggregated Analysis ▶	
Publish…	Process Cases Analysis ▶	
	Processes Comparison Analysis ▶	Processes Duration Comparison…
Process Friday, February 2, 2007 3:03:13 P…		Processes Activities Total Time Comparison…
Process Friday, February 2, 2007 3:03:13 P…		Processes Cost Comparison…
Process Friday, February 2, 2007 3:03:13 P…		Processes NPV/IRR Comparison…
Process Friday, February 2, 2007 3:03:13 P…		Processes Break Even Comparison…
Process Friday, February 2, 2007 3:03:13 P…		Processes Resources Time Comparison…
		Processes Resources Cost Comparison…
		Processes Classifier Duration Comparison…
		Processes Classifier Cost Comparison…

Figure 4-16. Processes comparison analysis (1)   WB286 / VB2861.0

Notes:

Processes comparison analysis (2)

- Processes duration comparison analysis
  - Compares the average duration and throughput of two processes

- Processes activities total time comparison analysis
  - Compares the average duration of two processes

- Processes cost comparison analysis
  - Compares the average cost and revenue results

- Processes NPV and IRR comparison analysis
  - Compares process net present value (NPV) and internal rate of return (IRR) analysis results that use the same input parameters

- Processes break-even comparison analysis
  - Compares the break-even analysis results

Figure 4-17. Processes comparison analysis (2)   WB286 / VB2861.0

Notes:

Processes comparison analysis (3)

- Processes resources time comparison analysis
  - Compares the average resource allocation durations based on the same simulation snapshot
  - Can be results from different profiles, or two sets of results from the same profile

- Processes resources cost comparison analysis
  - Compares the average resource allocation costs based on the same simulation snapshot
  - Can be results from different profiles, or two sets of results from the same profile

- Processes classifier duration comparison analysis
  - Compares the average classifier elapsed duration results that use the same input parameters

- Processes classifier cost comparison analysis
  - Compares the average classifier cost results that use the same input parameters

© Copyright IBM Corporation 2009

Figure 4-18. Processes comparison analysis (3)   WB286 / VB2861.0

Notes:

Dynamic analysis: Preferences

From menu bar, select **Modeling > Preferences > Business Modeling** to set display and precision variables

© Copyright IBM Corporation 2009
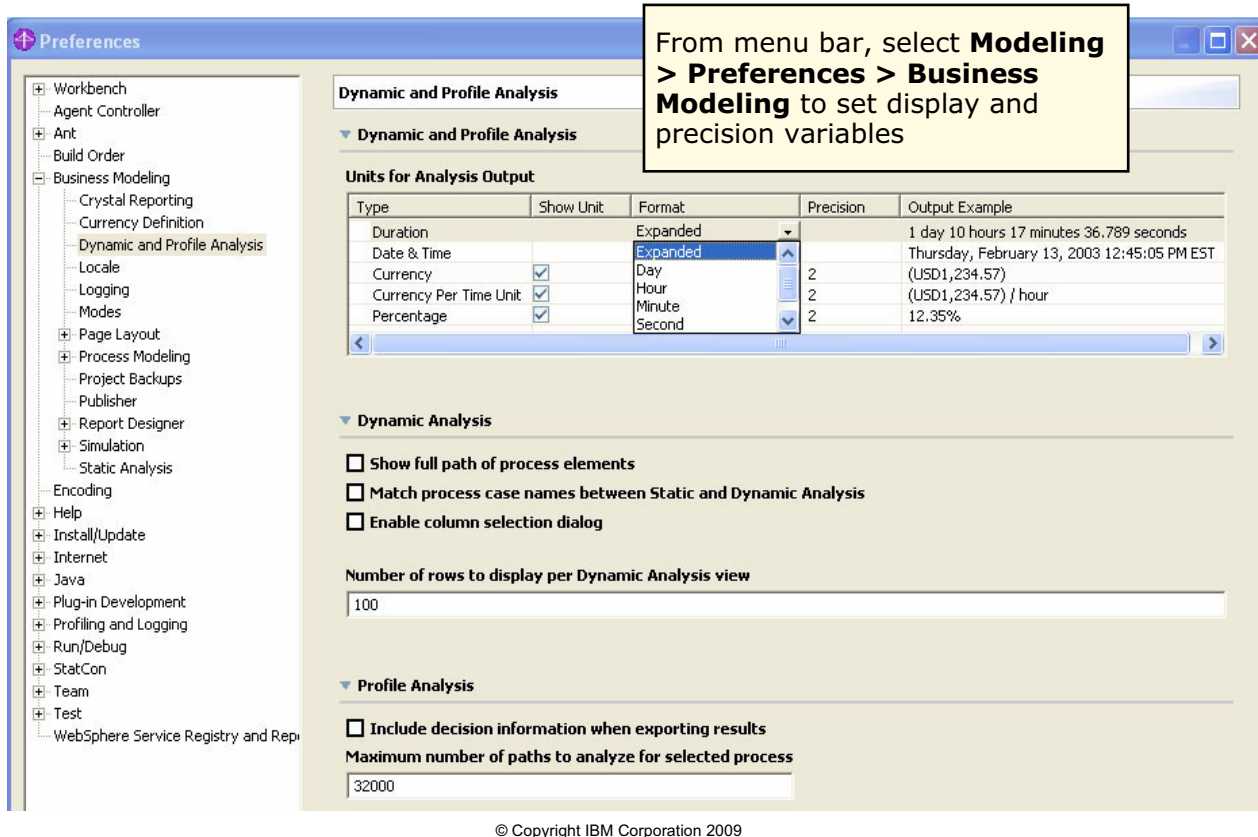
Figure 4-19. Dynamic analysis: Preferences

WB286 / VB2861.0

Notes:

The dynamic and profile analysis preferences affect the display and presentation of any analyses you carry out on your simulation profiles or simulation results

Use of statistical distributions in simulation

- Simulation provides an opportunity to understand how a process will behave once implemented.

- Statistical distributions allow a model to reflect more accurately the real world behavior of the business process.

- Distributions help build randomness into a model, something averages cannot do.

- Measured data may be limited, and making decisions with small sample sizes increases the risk of incorrect forecasts or decisions.

© Copyright IBM Corporation 2009

Figure 4-20. Use of statistical distributions in simulation   WB286 / VB2861.0

Notes:

Where are distributions used?

- In Modeler, probability distributions can be assigned to:
  – Token creation
  – Task completion times
  – Task costs
  – Task revenue

- Applying distribution settings to a model in the appropriate places enables greater accuracy in the representation of the process.

© Copyright IBM Corporation 2009

Figure 4-21. Where are distributions used?   WB286 / VB2861.0

Notes:

Distributions in WebSphere Business Modeler (1)

- **Normal**: The well-known bell curve

- **Uniform**: Distributes values evenly over a range

- **Triangular**: Useful for approximate modeling when no real-world results are available

- **Poisson**: Useful in characterizing discrete events occurring independently of one another in time

- **Random list**: Provides a list of values, any of which can be selected with equal probability

- **Weighted list**: Provides a weighted probability for each value you define

- **Continuous**: Useful for specifying ranges of values and a probability of each range
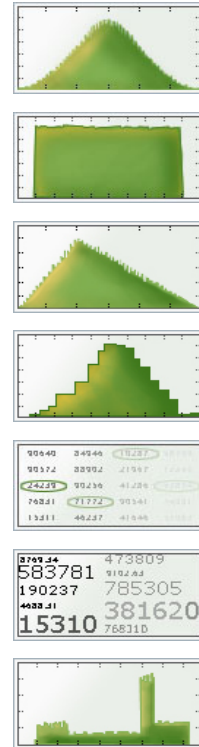
© Copyright IBM Corporation 2009

Figure 4-22. Distributions in WebSphere Business Modeler (1)   WB286 / VB2861.0

Notes:

Distributions in WebSphere Business Modeler (2)

- **Beta**: Useful for Bayesian statistical models, which represent degrees of belief

- **Erlang**: Useful for representing waiting times in queuing systems

- **Exponential**: Useful for characterizing random variables that can take only positive values

- **Gamma**: Useful for continuous random variables constrained to be equal to or greater than 0

- **Johnson**: Best fit distribution

- **Lognormal**: Useful for variables constrained to be greater than 0

- **Weibull**: Useful in modeling reliability, failure rates, and natural phenomena
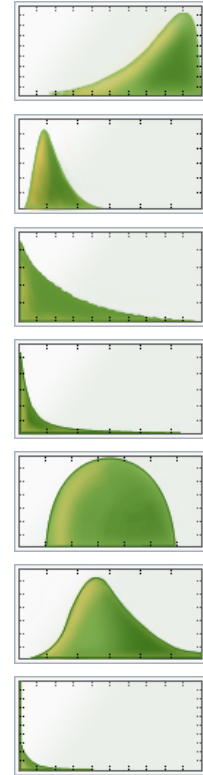
Figure 4-23. Distributions in WebSphere Business Modeler (2)   WB286 / VB2861.0

Notes:

Distribution parameters
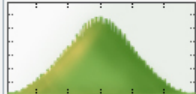
- The settings that you can specify depend on the type of distribution you select, as shown in the following table:

Distribution	▼

Type

Normal

The well-known bell curve.

Mean	Standard deviation
0.0|	0.0

Distribution type	Settings		Distribution type	Settings
Exponential	Mean		Weighted list	Probabilities, Values
Gamma	Mean, Standard Deviation		Random list	List if values
Lognormal	Mean, Standard Deviation		Beta	A,B
Normal	Mean, Standard Deviation		Continuous	Values, Probability
Poisson	Mean		Triangular	Minimum, Maximum, Mode
Uniform	Minimum, Maximum		Weibull	Alpha, Beta
			Erlang	Exp mean, K

© Copyright IBM Corporation 2009

Figure 4-24. Distribution parameters WB286 / VB2861.0

Notes:

Checkpoint

1. What is profile specification?

   _____

2. What is the function of Process Cases Summary?

   _____

3. What is dynamic analysis?

   _____

4. Which analysis shows the differences and similarities in simulation results between two different simulation runs?

   _____

5. What is the advantage of using statistical distributions in simulation?

   _____

Figure 4-25. Checkpoint   WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

3.

4.

5.

Unit summary

Having completed this unit, you should be able to:
- Conduct profile analysis using profile specification and case summary
- Conduct dynamic analysis from simulation results

Figure 4-26. Unit summary   WB286 / VB2861.0

Notes:

Checkpoint solution

1. What is profile specification?
   Profile specification provides a way of reviewing, documenting, and validating the values that are used during the run of a simulation
2. What is the function of Process Cases Summary?
   Process Cases Summary shows each of the process cases (paths) through the process
3. What is dynamic analysis?
   Analysis of the results of a process simulation from different perspectives: Time, money, and statistics Which analysis shows the differences and similarities in simulation results
4. Which analysis shows the differences and similarities in simulation results between two different simulation runs?
   Processes Comparison Analysis
5. What is the advantage of using statistical distributions in simulation?
   Build randomness into a model

Figure 4-27. Checkpoint solution   WB286 / VB2861.0

Notes:

Exercise overview

In this exercise you will:
- Use profile analysis
- Use dynamic analysis and aggregated analysis
- Use dynamic analysis — process analysis
- Generate and export reports
- Set up a simulation
- Run a simulation and generate analysis

Figure 4-28. Exercise overview WB286 / VB2861.0

Notes:

Unit 5. Process improvement

What this unit is about

This unit describes the process improvement.

What you should be able to do

After completing this unit, you should be able to:

- Describe strategies for improving processes
- Demonstrate best practices for analysis using WebSphere Business Modeler
- Use process model comparisons

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit 5. Process improvement **5-1**

Unit objectives

After completing this unit, you should be able to:
• Describe strategies for improving processes
• Demonstrate best practices for analysis using WebSphere Business Modeler
• Use process model comparisons

© Copyright IBM Corporation 2009

Figure 5-1. Unit objectives WB286 / VB2861.0

Notes:

Using Modeler to improve business processes
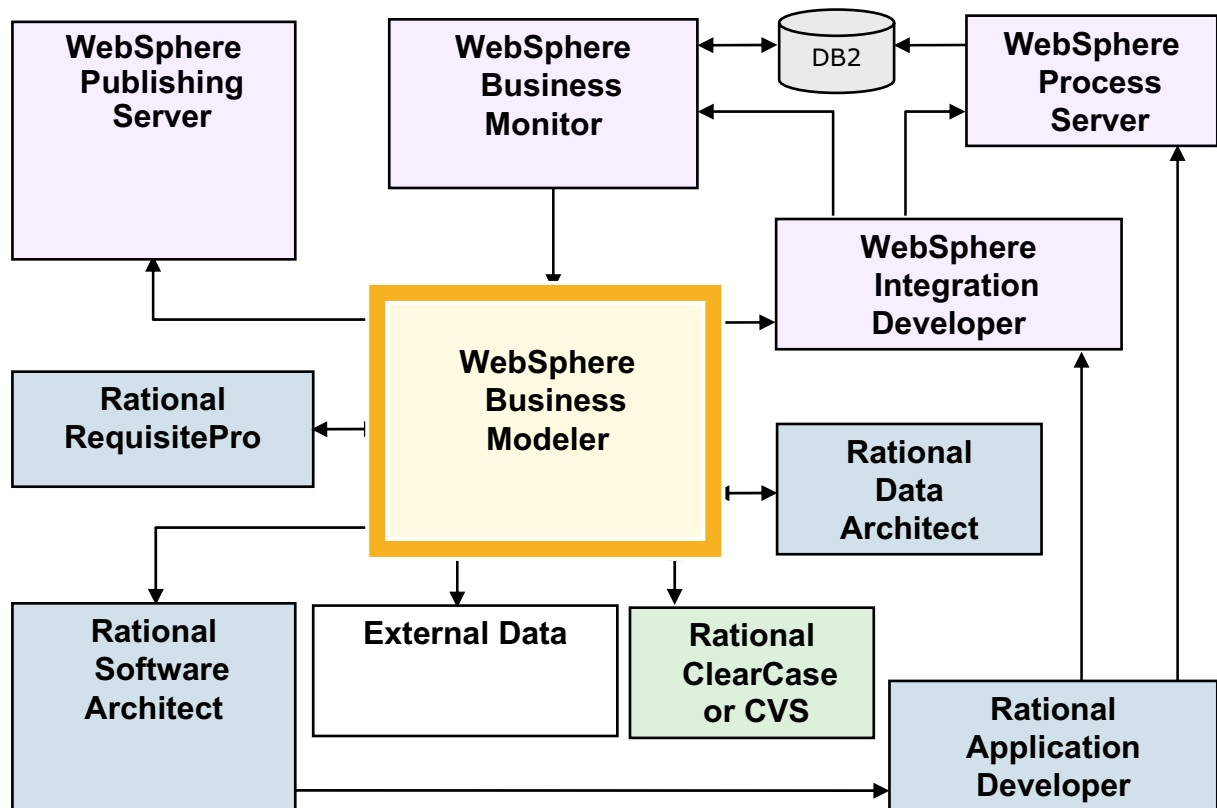
© Copyright IBM Corporation 2009

Figure 5-2. Using Modeler to improve business processes   WB286 / VB2861.0

Notes:

1. A process model is built using existing information or future design information in WebSphere Business Modeler.

2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.

3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.

4. Additional IT information can be imported from Rational Data Architect to support development.

5. Business requirements are synchronized with the process model using Rational RequisitePro.

6. Models are exported to WebSphere Publishing Server for review using a Web browser during development and later in production.

7. When the new process is ready for development UML to build new services is exported to Rational Software Architect.

8. Once the software design is done the code is developed in Rational Application Developer and exported for further development and execution.

9. Workflow code is developed in WebSphere Integration Developer using the base BPEL from the model and the WSDLs that were developed. The completed code is exported for execution and monitoring.

10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.

11. Production data is monitored by management using WebSphere Business Monitor and information is passes back to modeler for future analysis.

Audience perspectives

- To evaluate alternative solutions, it is necessary to understand the audience perspectives of model content.

- Content relates to the process objects and the data contained in each object.

- A company executive may not need to see detailed task interactions with various applications, as would a software architect.
  - However, the data needs to be in Modeler's repository.
    - Modeler provides for this using subprocesses and in setting the operational mode.
  - Model content should reflect the needs of the intended audience.
  - Models can store content for multiple audiences, so filter the content for a presentation to reduce or avoid confusing a specific audience.

© Copyright IBM Corporation 2009
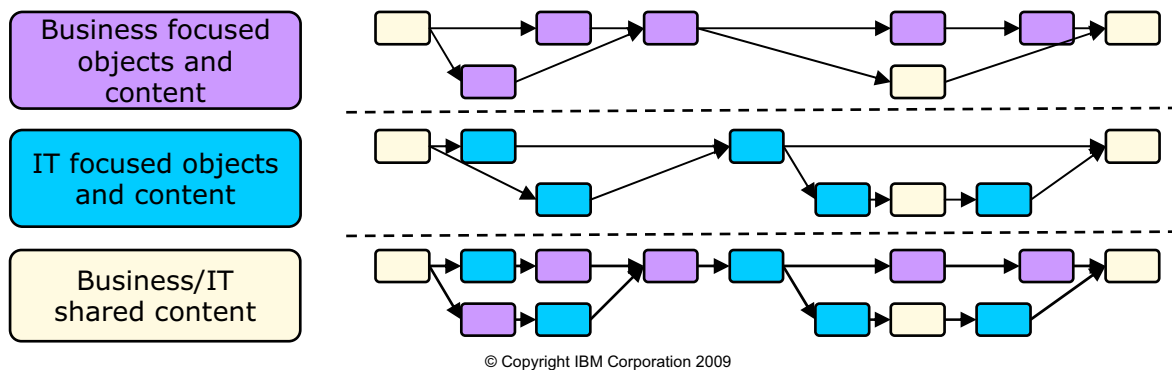
Figure 5-3. Audience perspectives   WB286 / VB2861.0

Notes:

Comprehensive model

- Evaluation of all alternative solutions requires understanding the comprehensive model.

- Comprehensive models contain shared content and shared process flows.
  - Model diagram (process flow) represents tasks for people and systems, their inputs and outputs, and the decisions that direct the flow of the key business item.
  - Model elements contain data that is relevant to both business and technology.

- Process re-engineering requires the analysis of:
  - Business
  - People
  - Process
  - Technology
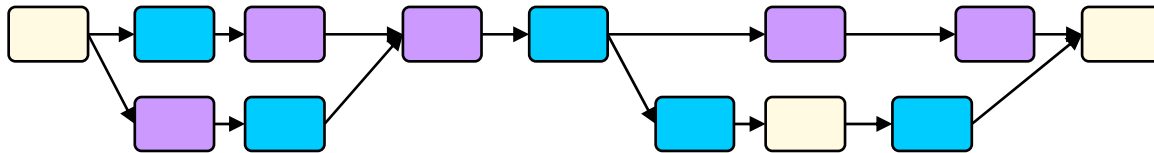
© Copyright IBM Corporation 2009

Figure 5-4. Comprehensive model WB286 / VB2861.0

Notes:

Balance of content versus level of detail

- Content refers to the data collected about each process object.
  - Summary content may include the task name and the role of the person responsible for its execution.
  - Detailed content might include: task name, role, duration, cost, application resources, bulk resources, departmental structure, and inputs.

- Level of detail refers to how the process is described.
  - A high level of detail for sending a letter could be a task.
    - "Send letter"
  - At a lower level of detail:
    - Fold completed letter
    - Place in envelope
    - Seal envelope
    - Address and stamp envelope
    - Deliver to mailbox

| Universe |
| Economy |
| Business |
| Process |
| Task |
| Step |
| Movement |
| Atomic |
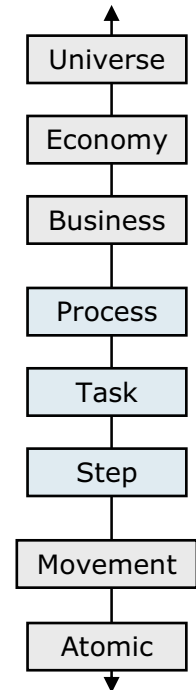
One task may represent five steps from a lower level of detail.

© Copyright IBM Corporation 2009

Figure 5-5. Balance of content versus level of detail WB286 / VB2861.0

Notes:

Successful evaluation of the alternatives also requires a balance of content versus level of detail.

Root cause analysis

Generic problem identification

Task input	→	Task	→	Task output

- **Input issues**
  - Wrong data
  - Insufficient data
  - Incorrect timing
  - Wrong format

- **Task**
  - Duration too long
  - Cost too high
  - Role unavailable
  - Role not qualified or overqualified
  - Too much volume
  - Resources unavailable
  - Business rules not aligned

- **Task output**
  - Incomplete or incorrect business item
  - Incorrect timing for next task
  - Medium too slow
  - Output sent to wrong next step

Input issues may be the true root cause for task problems

Output issues become the input problem and cause for the next task

© Copyright IBM Corporation 2009

Figure 5-6. Root cause analysis   WB286 / VB2861.0

Notes:

The most desirable solution may be too aggressive and attempt to address too many of the process problems.

Process issues affect business goals

- Business processes break down for a number of reasons.
  - Many of them are hidden and difficult to isolate.

- A model can reduce process complexity by highlighting areas with known problems when the model is constructed, including:
  - Multiple iterations
  - High costs
  - Long process delays
  - Limited or too many resources
  - Bottlenecks

Figure 5-7. Process issues affect business goals   WB286 / VB2861.0

Notes:

The best alternative is a based on a modeling that isolates business issues which are most important to the goals.

Future process model

- The diagram illustrates how each model becomes the foundation for the next phase.
  - The structural model facilitates the documentation of the current state, models are analyzed, results are published, and so on.
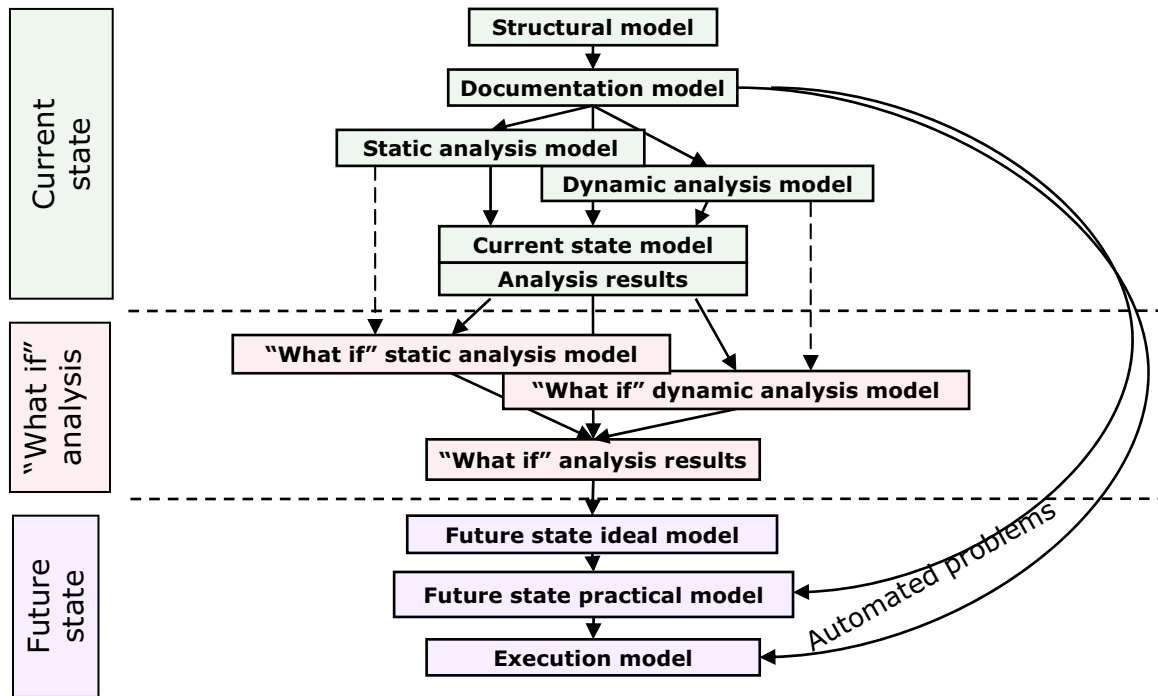
© Copyright IBM Corporation 2009

Figure 5-8. Future process model   WB286 / VB2861.0

Notes:

The final future process model will be selected in the later phases of the project

Boxes in bold are deliverables for each phase.

This diagram shows that each of the model iterations or versions is the foundation for future model iterations or versions.

The reveal shows "Automated Problems" if you skip from current state process identification straight to the future state business and execution models without performing any analysis.

There is actually some analysis in future state as well, although it is not shown.

Process model phases: task details

- The flow below describes the same set of processes at different points in the life cycle.
  - As a process is refined through its life cycle, the emphasis on certain process details may shift.
  - The tasks and content defined for a business owner may be less relevant to an IT solution lead developing workflow.

© Copyright IBM Corporation 2009
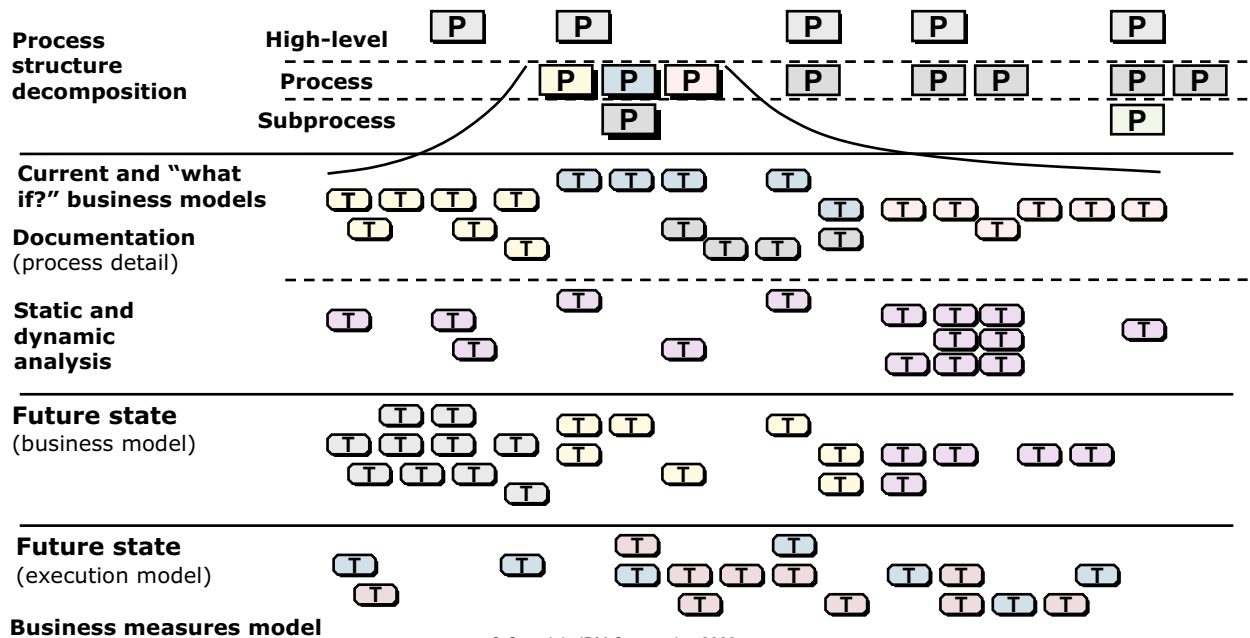
Figure 5-9. Process model phases: task details   WB286 / VB2861.0

Notes:

In this example, you take a single end-to-end process (identified at the high level in line one) and break it down.

- In the first two lines, it becomes three processes and a subprocess.

- In current state onwards, you see the processes broken down into tasks.

- In current state analysis, you decide to focus on the back end of the process, and so break out those tasks into more detail. At the front end of the process, you aggregate the tasks into a higher level view as you are not interested in analyzing this part. You can have a process where there are tasks at different levels of detail in the same model, depending on what information is required for analysis.

- In the future state, you see that by putting some extra manual effort up front in the process, you can solve the problems you were having at the end.

- In the execution model, you see that the back end of the process is now automated, as the complexity is removed by spending the manual effort up front in the process.

- In the business measures model (white), you see the points at the beginning and ends of pieces of work where you want to capture metrics.

Business analysis components

- **Process goals**: The purpose of the project or process.
- **Metrics**: Process analysts identify what to capture in the model.
  - What the model needs to produce for reporting and analysis.
- **Proficiencies**: Identify what the process and participants do well.
- **Pain points**: Provide focus for model creation and analysis.
  - Model should be able to prove or disprove these claims though the quantification of the process data.

Process goals	Metrics
• Reduce the cost of a claim • Meet corporate financial goals • Satisfy customer with improved cycle time • Reduce rework • Reduce mistakes and improve data integrity	• Percent of time claim is approved • Percent of time credit information is inaccurate • Percent of time rework is required • Overall process time and cycle time
Proficiencies	**Pain points**
• Experienced team • Openness to critique and change • Process flexibility • Claims	• High-level direction not adequate • Client information is duplicated • Cost tables are inconsistent • Reporting needs improvement • Need collaboration between underwriting and billing

© Copyright IBM Corporation 2009

Figure 5-10. Business analysis components   WB286 / VB2861.0

Notes:

Sample business analysis

- Process overview (work steps)
  - 198 steps in the product development process
    - 171 internal activities
    - 27 external activities

- Task classification
  - 35% of steps add value to the product
  - 50% are related to data entry
  - 35% are related to tracking information or products
  - 32% are approval tasks

- Information (inputs and outputs)
  - 73 pieces of information used in the process
    - Documents, spreadsheets, reports, bill of materials, hardware
  - Information handed off 387 times
  - On average, each piece of information moved about five times

© Copyright IBM Corporation 2009

Figure 5-11. Sample business analysis   WB286 / VB2861.0

Notes:

Sample "what if?" scenarios

	Current state variables and analysis results		"What if?" assumptions and results are analyzed to achieve best future state					Combination of all assumptions yields the ideal future state
		As is	Delivery	Fax and printing	Data quality	Improve technology	Process	All
Results	**METRICS** Process time (days) Working time (hours) Resource cost	7.58 30.15 $46.44	7.37 26.52 $41.49	7.58 21.82 $35.17	6.02 26.98 $41.49	7.58 25.77 $37.51	7.23 23.00 $32.29	5.38 15.13 $20.34
Task variables	**TASKS (values in minutes)** Receive request Review customer request Contact customer Contact internal team Create draft order for review Review order for quality Pick order Ship order Paperwork distribution (acct) File order	 1.2 1.2 4.7 4.7 7.1 0.4 4.7 3.6 1.2 1.2	 1.2 1.2 4.7 4.7 7.1 0.4 2.4 2.4 1.2 1.2	 1.2 1.2 4.7 4.7 3.6 0.4 4.7 3.6 1.2 1.2	 1.2 1.2 4.7 4.7 7.1 0.4 4.7 3.6 1.2 1.2	 1.2 1.2 4.7 4.7 4.7 0.4 4.7 3.6 0.0 1.2	 1.2 1.2 4.7 4.7 4.7 0.4 4.7 2.4 0.6 0.0	 1.2 1.2 4.7 2.4 3.6 0.4 2.4 2.4 0.0 0.0
Decision variables	**DECISION choices** Re-contact customer? Call internal team? Fax and print correctly Quality check (pass)	 20% 20% 75% 23%	 15% 20% 75% 23%	 20% 20% 95% 23%	 20% 20% 75% 10%	 20% 20% 75% 23%	 20% 20% 75% 20%	 5% 5% 95% 10%

© Copyright IBM Corporation 2009

Figure 5-12. Sample "what if?" scenarios   WB286 / VB2861.0

Notes:

A case for change

- Deciding what to present to build a case for change

- Expansion versus decomposition
  - Expand the high-level diagram or decompose it?
  - Or use a combination of expansion and decomposition?

Figure 5-13. A case for change WB286 / VB2861.0

Notes:

Expansion versus decomposition: high level

- The high-level perspective provides a contextual end-to-end diagram.
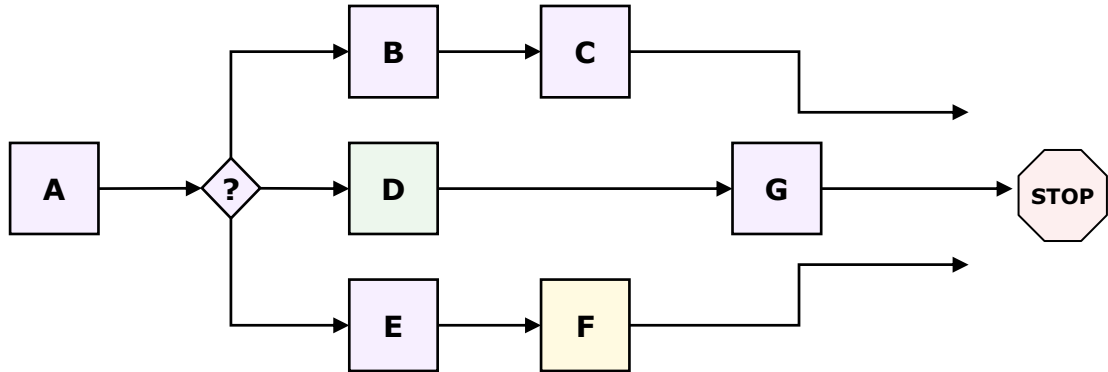
Figure 5-14. Expansion versus decomposition: high level WB286 / VB2861.0

Notes:

Expansion

- Expansion enforces collaboration by providing impact visibility, but the diagram becomes complex.
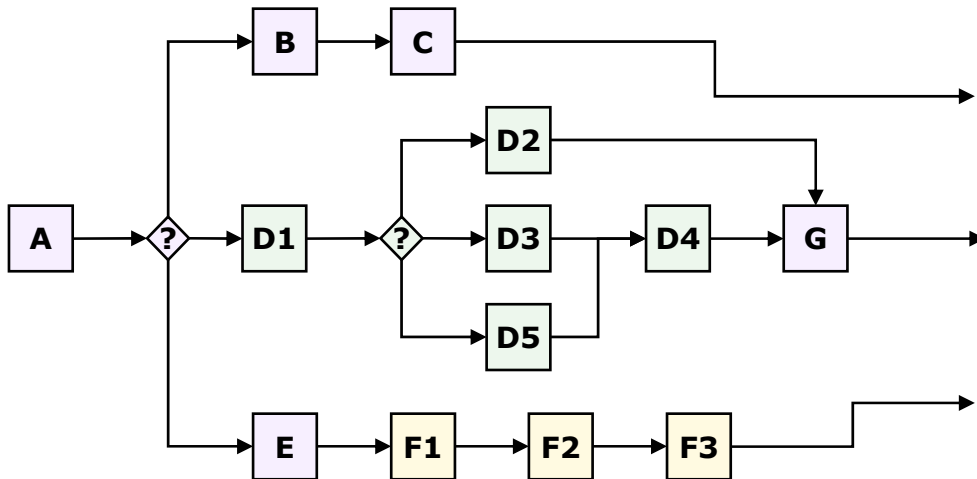
Figure 5-15. Expansion   WB286 / VB2861.0

Notes:

Decomposition (1)

- Decomposition establishes boundaries, thereby enforcing silos, but may lead to oversimplification.
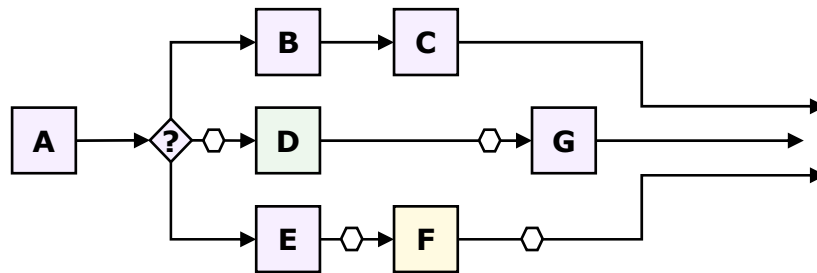
Figure 5-16. Decomposition (1)   WB286 / VB2861.0

Notes:

Decomposition (2)

- Expansion of D as a separate subprocess
  - Note that this information may be lost in decomposition, although it was visible in expansion.
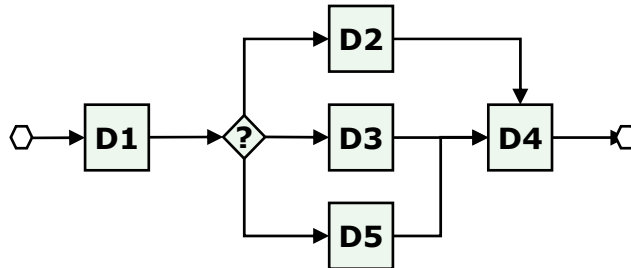
- Expansion of F as a separate subprocess
  - Note that F is a stand-alone process and matches the boundaries.
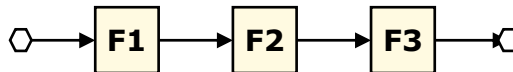
© Copyright IBM Corporation 2009

Figure 5-17. Decomposition (2)   WB286 / VB2861.0

Notes:

Expansion versus decomposition: both

- Expand where collaboration occurs and decompose where boundaries are clearly defined.
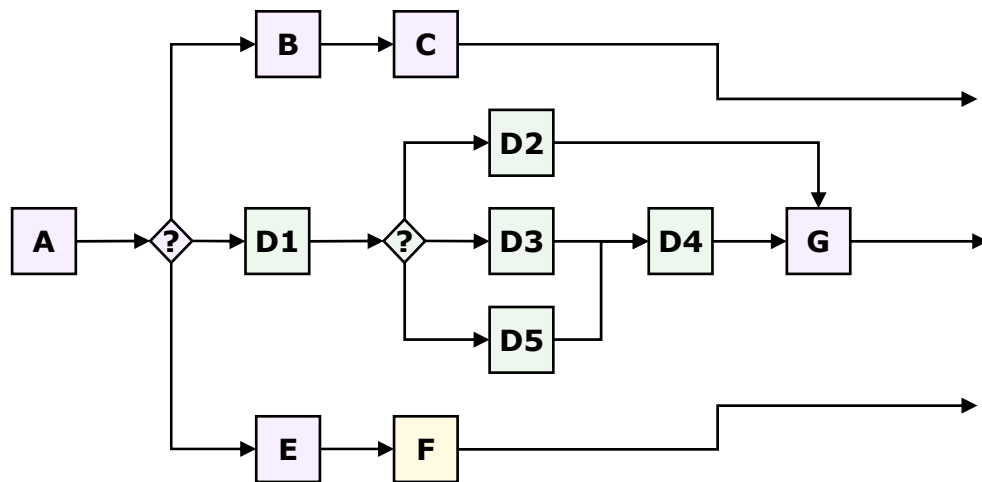
© Copyright IBM Corporation 2009

Figure 5-18. Expansion versus decomposition: both   WB286 / VB2861.0

Notes:

Expansion versus decomposition: subprocesses

- Logical collection of tasks and decisions that generate an output
- When to use:
  - When the collection of tasks is reused in multiple processes across functional areas
  - To simplify a long set of tasks which are not relevant to the picture, but relevant to the data being analyzed
- Subprocesses: The exception rather than the rule
- Driven from an end-to-end perspective
- Establish boundaries through process decomposition
- Example:
  - An imaging process converts paper documents into electronic form.
    - This subprocess could appear in many processes whenever a paper document is required in electronic format.
      - The details of this subprocess are not important to the picture of the process containing it, but the details are relevant to the calculations (data) of cost.

Figure 5-19. Expansion versus decomposition: subprocesses WB286 / VB2861.0

Notes:

Modeling for rework and process volume

- Modeling to show activities
  - Different ways of drawing the flow means different things.
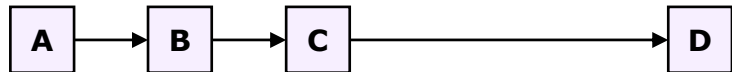
Tasks
As they occur in a perfect process

```
A → B → C ──────────→ D
```

Tasks — Resource perspective
Showing rework as a function of resources — described as a role or resources loop
Resources often rework activities B and C
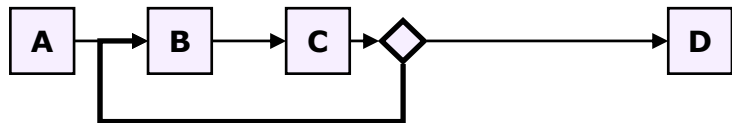
```
A → B → C → ◇ ──────→ D
      ↑_____|
```

Tasks — Sequence perspective
Showing rework as a function of the sequence of steps over time — described as additional tasks
Resources often rework activities B and C drawn to illustrate — **cannot go back in time**

```
A → B → C → ◇ ──────→ D
            ↓        ↑
           B+ → C+ ──|
```
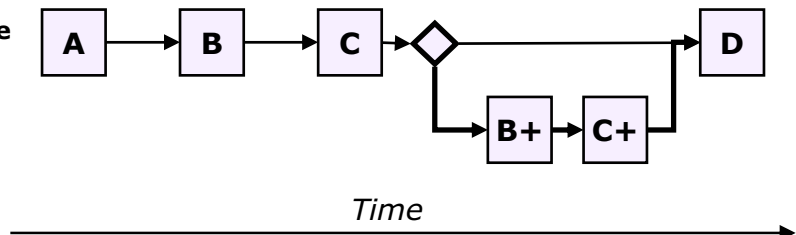
Time →

© Copyright IBM Corporation 2009

Figure 5-20. Modeling for rework and process volume   WB286 / VB2861.0

Notes:

Here you have a straight sequence of tasks. However, from time to time the tasks are done incorrectly and you say "go back to step B and do it again". In fact, what is happening is the work is being returned to the resource, but not to the task. The task has changed (B+) because the work may be described as "correct" form (rather than "complete" form) -- two entirely different things. Therefore, to correctly model the process as it occurs from the perspective of the work product, you would see the bottom sequence.

Rework and process volume: pain points

- Pain points recorded from subject matter experts, as a result of process volume

Resource perspective

Modeled where the jobs are not returned to the same individual — **in a rework loop**

"We are overloaded..."
"We need more staff..."

A → B → C → ◇ — 34% — D
66%

"We are not getting things on time..."
"There are too many steps in the process..."

Sequence perspective

A → B → C → ◇ — 34% — D

"We are getting a lot of errors..."
"We are having to redo work!..."

66% → B+ → C+

Time
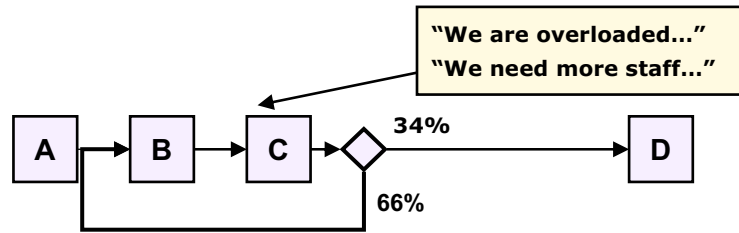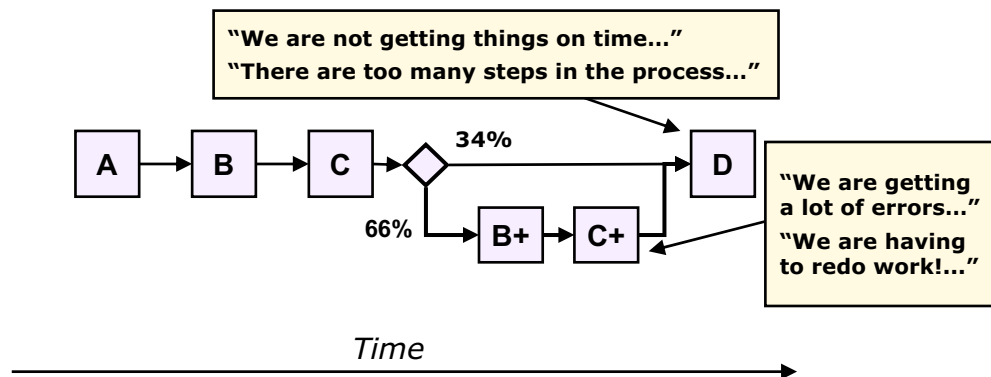
Figure 5-21. Rework and process volume: pain points   WB286 / VB2861.0

Notes:

In the pain points on the top scenario, the resources performing tasks B and C are overloaded. They are performing the work once; then 66% of the time, they are doing it again.

Rework: volume

- Modeling to show the volume (throughput) impact on the process

Tasks
As they occur in a perfect process
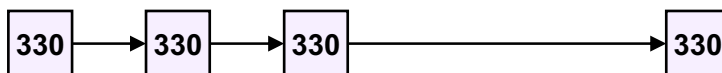
| 330 | → | 330 | → | 330 | ————————————————→ | 330 |

Tasks — Resource perspective
Showing rework as a function of resources — described as a role or resources loop

330 → 550 → 550 → ◇ — 34% — → 330
66%

Tasks — Sequence perspective
Showing rework as a function of the sequence of steps **over time** — described as additional tasks

330 → 330 → 330 → ◇ — 34% — 110 → 330
66% → 220 → 220
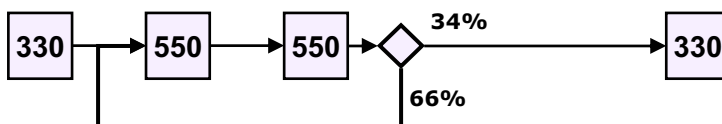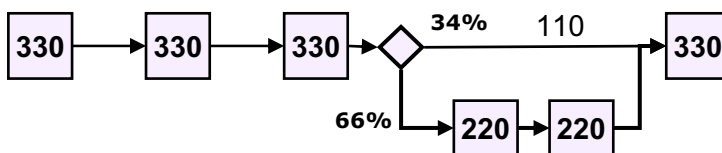
Time ————————————————→

Figure 5-22. Rework: volume   WB286 / VB2861.0

Notes:

Here you see manifesting as 550 tokens in volume for the two tasks, but this work is hidden to the eye. It can only be visually shown in the button sequence (where the repeated steps are broken out separately).

Process goal analysis

- Process goals are derived from specific organization goals and customer requirements.
  - Organizations achieve their goals through the operations of their processes.

- Process goal analysis is used to analyze a process to determine how well it supports the organization's goals.
  - The performance of the process is analyzed and evaluated against its goals.
  - Goal analysis allows the focus to be set on increasing the probabilities of process cases that support organizational goals.
    - Therefore, it reduces the probabilities of cases that do not support goals.

Figure 5-23. Process goal analysis

Notes:

Redesign analysis

- Shows the effects of adding tasks to, or deleting tasks from, a process during the redesign phase

- Use redesign analysis when you need to:
  – Identify improvement opportunities within a process
  – Measure the effects of redesigning a process

Figure 5-24. Redesign analysis WB286 / VB2861.0

Notes:

Redesign the process

- "As-is" process
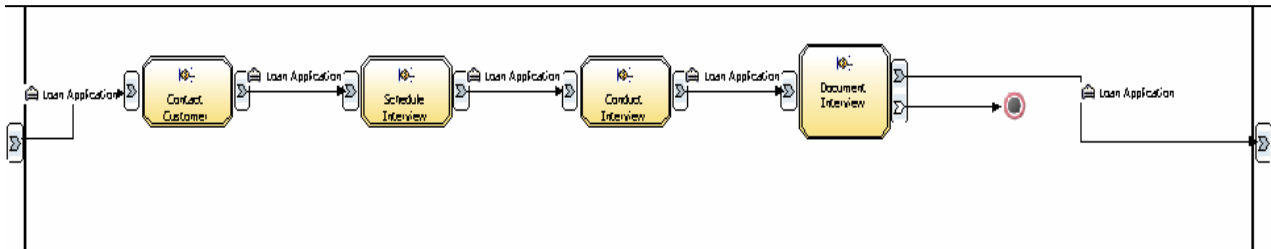
- "To-be" process
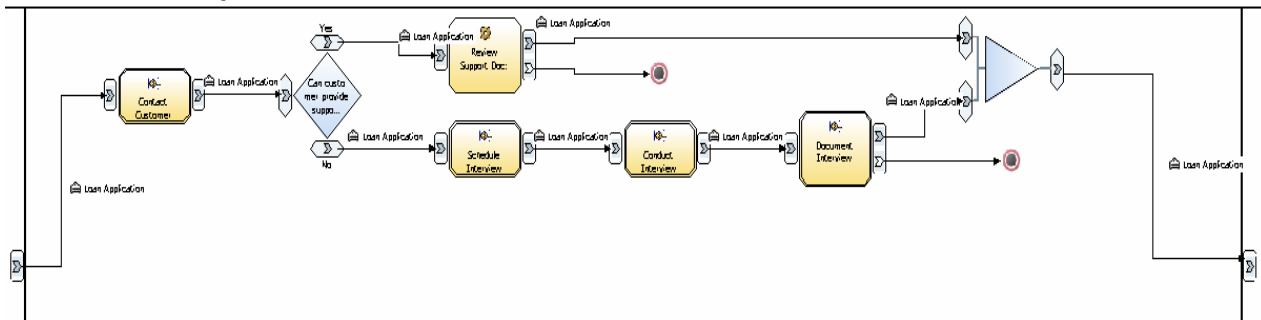
Figure 5-25. Redesign the process   WB286 / VB2861.0

Notes:

Comparison analysis

- Once simulations complete, dynamic analysis reports can be run
  - Comparing the results from the As Is and each of the To Be alternatives
  - Process comparison reports show how the To Be process expects to perform versus the As Is
    - Trying to reduce the process cycle times and the costs in the To Be version

Processes Duration Comparison | Simulation result - Current | Verify Credit - Current Wednesday, October 29, 2008 8:57:20 PM | 10:55:				
	Simulation Result Name	Process Name	Average Elapsed Duration	Average Throughput
	Simulation result - Current	Verify Credit - Current	11 hours 46 minutes 39...	0.08 work item / hour
	Simulation result - Future	Verify Credit - Future	5 hours 15 minutes 59....	0.19 work item / hour
Difference			6 hours 30 minutes 39....	-0.10 work item / hour
Percentage Change			55.28%	-123.63%

© Copyright IBM Corporation 2009

Figure 5-26. Comparison analysis   WB286 / VB2861.0

Notes:

Checkpoint

1. What types of analysis should be used for process re-engineering?

   _____

2. What is process goal analysis?

   _____

3. When do you need to conduct redesign analysis?

   _____

4. What are the four business analysis components?

   _____

Figure 5-27. Checkpoint   WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

3.

4.

Unit summary

Having completed this unit, you should be able to:
- Describe strategies for improving processes
- Demonstrate best practices for analysis using WebSphere Business Modeler
- Use process model comparisons

© Copyright IBM Corporation 2009

Figure 5-28. Unit summary

WB286 / VB2861.0

Notes:

Checkpoint Solution

1. What types of analysis should be used for process re-engineering?
   Business, people, process, and technology
2. What is process goal analysis?
   Process goal analysis is used to analyze a process to determine how well it supports the organization's goals. The performance of the process is analyzed and evaluated against its goals. It allows the focus to be set on increasing the probabilities of process cases that support organizational goals
3. When do you need to conduct redesign analysis?
   When you want to identify improvement opportunities within a process or measure the effects of redesigning a process
4. What are the four business analysis components?
   Process goals, metrics, proficiencies and pain points

Figure 5-29. Checkpoint Solution   WB286 / VB2861.0

Notes:

Exercise overview

In this exercise you will:
- Redesign your model
- Set up simulation settings for the redesigned model
- Run simulations and generate analyses for the redesigned model
- Compare simulation results

Figure 5-30. Exercise overview   WB286 / VB2861.0

Notes:

Unit 6. Custom reports and queries

What this unit is about

This unit describes the custom reports and queries.

What you should be able to do

After completing this unit, you should be able to:

- Explain the process of creating custom reports
- Create report templates using data sources
- Export reports
- Use predefined and custom queries

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
- Explain the process of creating custom reports
- Create report templates using data sources
- Export reports
- Use predefined and custom queries

© Copyright IBM Corporation 2009

Figure 6-1. Unit objectives WB286 / VB2861.0

Notes:

Creating custom reports in Modeler
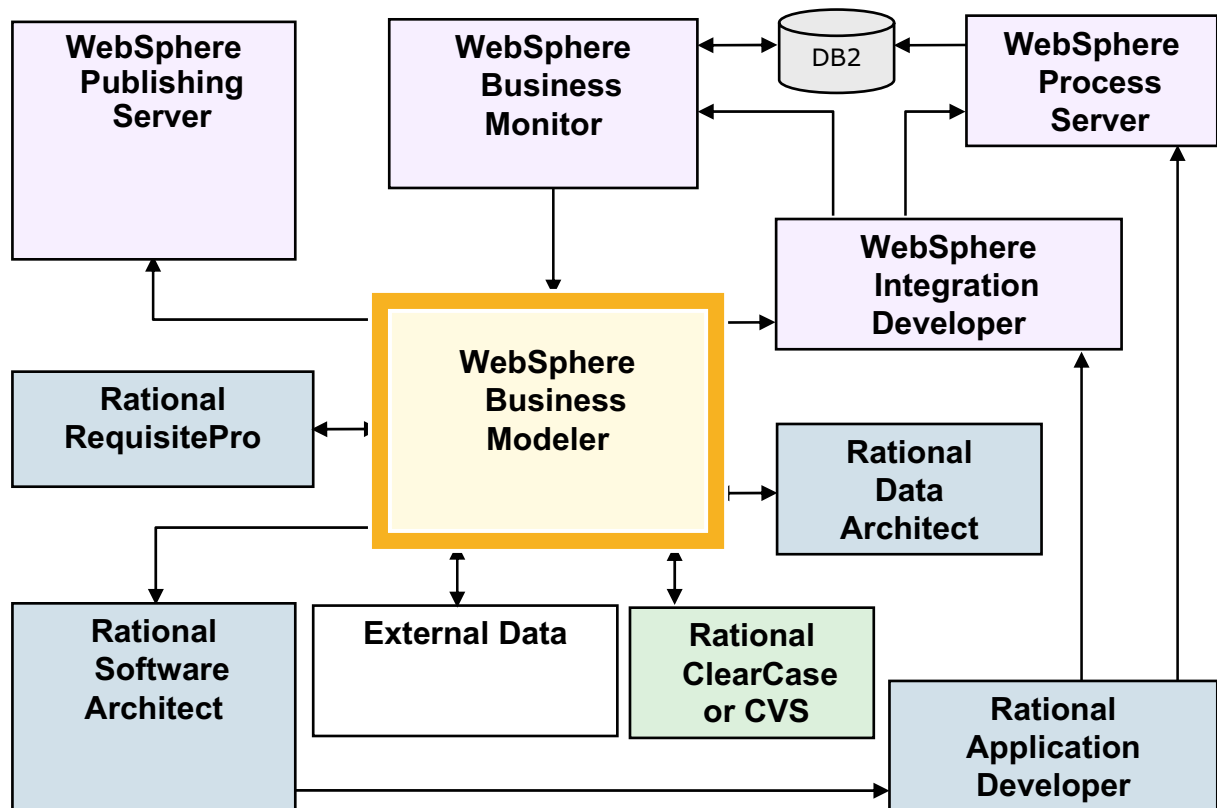
© Copyright IBM Corporation 2009

Figure 6-2. Creating custom reports in Modeler   WB286 / VB2861.0

Notes:

1. A process model is built using existing information or future design information in WebSphere Business Modeler.

2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.

3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.

4. Additional IT information can be imported from Rational Data Architect to support development.

5. Business requirements are synchronized with the process model using Rational RequisitePro.

6. Models are exported to WebSphere Publishing Server for review using a Web browser during development and later in production.

7. When the new process is ready for development UML to build new services is exported to Rational Software Architect.

8. Once the software design is done the code is developed in Rational Application Developer and exported for further development and execution.

9. Workflow code is developed in WebSphere Integration Developer using the base BPEL from the model and the WSDLs that were developed. The completed code is exported for execution and monitoring.

10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.

11. Production data is monitored by management using WebSphere Business Monitor and information is passes back to modeler for future analysis.

Reports

- Reports are a formatted presentation of information relating to a model or to the results of analyzing a process simulation.
  - Predefined report details
    - Numerous predefined reports available in the product
  - Custom reports using report designer
    - Report catalogs
      - Organize report templates for different projects or uses
    - Report templates
      - Produce detailed reports with specific content in a specified format
    - Report style masters
      - Reuse header and footer content for multiple report templates

- Crystal Reports.
  - Alternative way of creating and generating report templates

© Copyright IBM Corporation 2009

Figure 6-3. Reports   WB286 / VB2861.0

Notes:

Queries

- Queries enable the extraction and viewing of selected information on elements in a model.
  - Predefined queries:
    - Several predefined queries can be used to extract and view a predefined set of information from a model.
  - Custom queries using query builder
  - Use the query builder to create queries

Figure 6-4. Queries   WB286 / VB2861.0

Notes:

Data sources

- Data sources are sets of information derived from project elements.
  - Use data sources as the basis for defining report templates in report designer.

- The data source depends on information to be provided by the report.
  - Reports on resources may use the resource specification data.
  - Reports on detailed process information may use the process specification data.

Create a new report template

Select Data Source

Select a datasource

Data Source

- No Data Source
- Business Models
- Dynamic Analysis
- Predefined Queries
- Query
- Simulation Description
- Static Analysis
- Team Support

Reporting designer

◉ WebSphere Modeler ○ Crystal

[< Back] [Next >] [Finish] [Cancel]
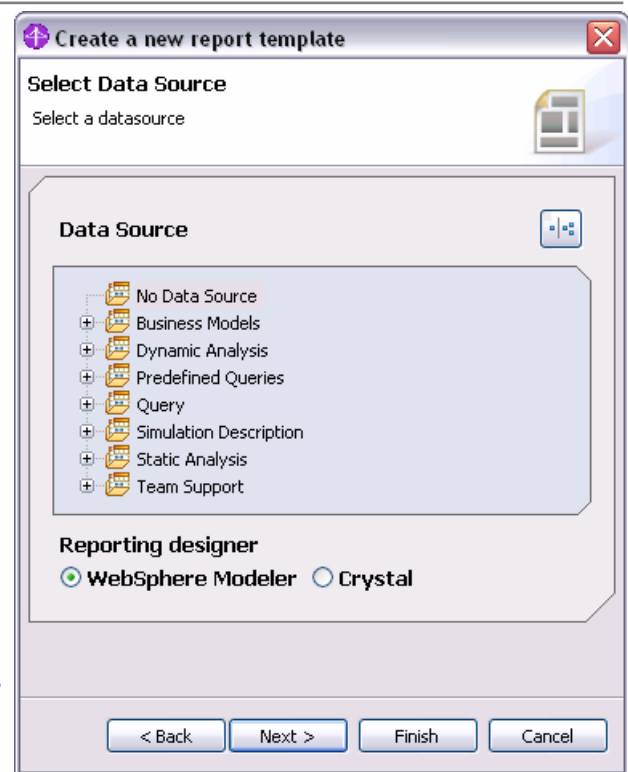
© Copyright IBM Corporation 2009

Figure 6-5. Data sources   WB286 / VB2861.0

Notes:

Categories of data sources

Data source	Description
Business model	Information contained in business model
Dynamic analysis	Information returned by the different types of dynamic analysis
Predefined queries	Information contained within predefined queries included in the product
Query	Information from custom queries
Simulation description	Information contained in simulation profiles
Static analysis	Information returned by the different types of static analysis
Team support	Information contained in a repository location
No data source	Used to create a blank report template with no data source associated

© Copyright IBM Corporation 2009

Figure 6-6. Categories of data sources   WB286 / VB2861.0

Notes:

Each of these data source categories contains one or more options that you can choose to add to your report template. For example, in the Business Models category, you can choose any existing business model data source, such as Business Item Specification or Process Level Details. If you create the template without specifying the data source, you can add the data source later in the fields view.

Once you create a report template and specify its data source, you can work with the graphical editor and the fields view to select the specific fields to include in the report template from the list of all available fields in the data source.

Note: You can see a complete listing of the available fields for a data source by creating a report template that uses that particular data source.

Business model data sources

Business Model data sources represent information that is contained in your business models.

Dynamic analysis data sources

Dynamic analysis data sources represent information that is returned by the different types of dynamic analysis that you can perform on process simulations.

Query data sources

Query data sources are based on queries that you have defined. Each results field that you define for the query is represented as a field in the data source.

Team support data sources

Team support data sources represent information contained by a CVS repository location. The following data source is provided:

History report

Note: Because business services (WSDL files) and business service objects (XSD files) are stored by the model as external objects, information regarding them may not be consistently reported or displayed by the report templates.

Note: If a timetable refers to other timetables to define exemption periods, then any reports generated about the main timetable will also contain information about all of the timetables that it references.

Creating report catalogs

- Report catalogs help organize report templates.
  - Created in the Project Tree
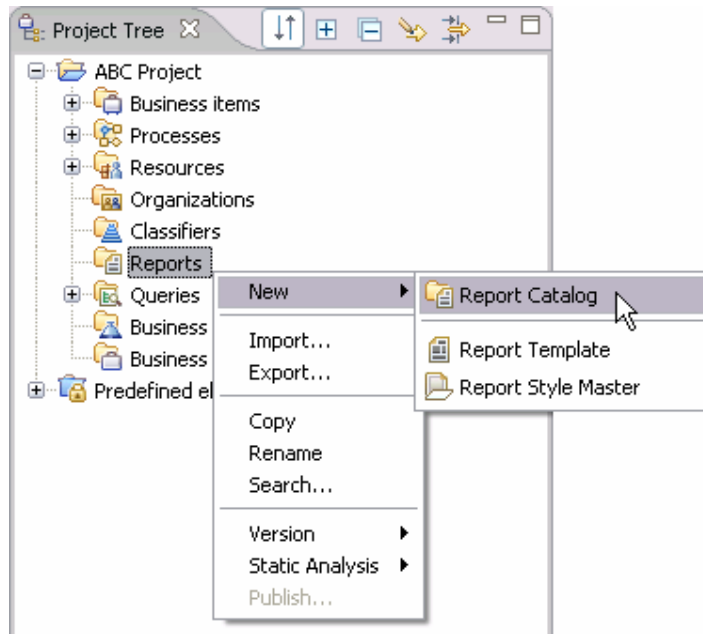
© Copyright IBM Corporation 2009

Figure 6-7. Creating report catalogs   WB286 / VB2861.0

Notes:

Report templates

- Create detailed reports for your processes containing data that you have specified.
  - Use report designer to create report templates that have the exact content and presentation that you need.

- A report template can be run against different process models to generate results specific to each model.
  - An efficient way to create multiple reports that contain the specific information that you want to display.
    - For example, every report is required to have company name, address, and date.

- It can take some time to create and polish a template's design.
  - The effort invested in building a template provides the flexibility to generate any number of reports.

Figure 6-8. Report templates WB286 / VB2861.0

Notes:

Report designer (1)

- The report designer, like the process editor and the structure editor, is a graphical editor with a palette that contains elements that can be added to the report template.
  - Pages and page breaks
  - Page headers and footers
  - Tables
  - Shapes, including lines, rectangles, circles, and ellipses
  - Static text fields
  - Pictures
  - Charts
  - Table of contents
  - Summary statistics fields (such as counts, sums, and averages for selected data fields)
  - Report special fields (such as page numbers, print date, and record number)
  - Groups (a set of reporting elements such as labels and data fields that can be repeated multiple times in a generated report)

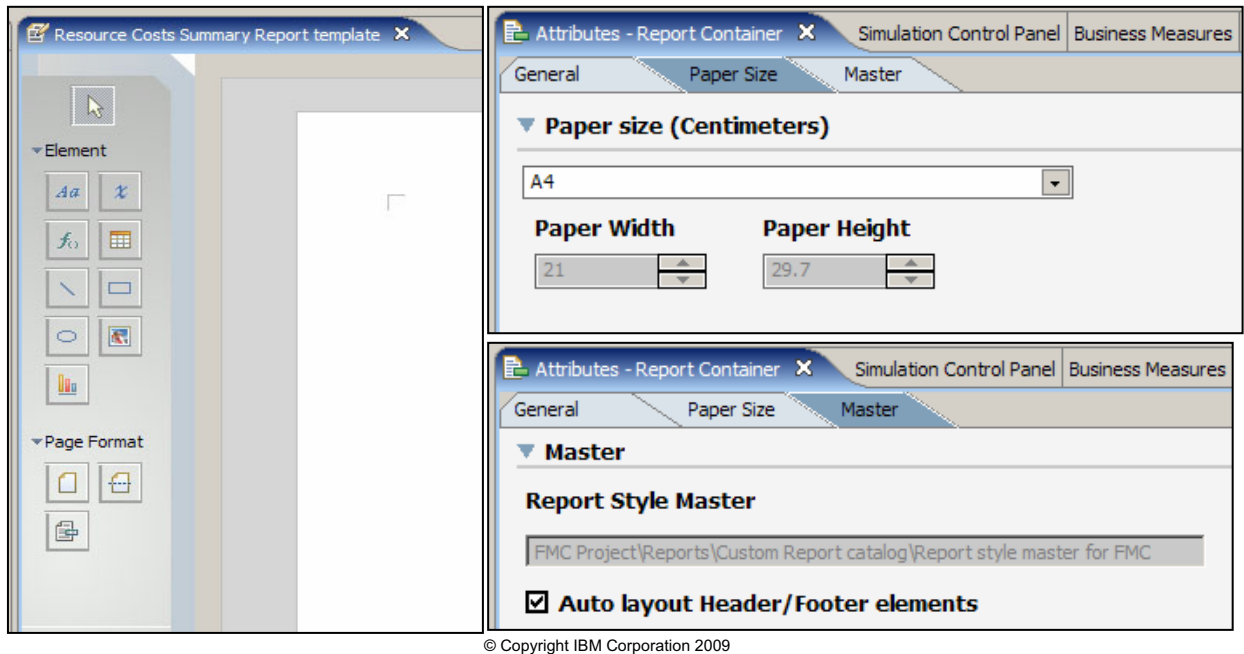Figure 6-9. Report designer (1)   WB286 / VB2861.0

Notes:

Report designer (2)

- Report designer provides many options for you to customize the appearance of elements that you add to the report template.
  - When an element is selected, the Attributes view can be used to edit the properties.
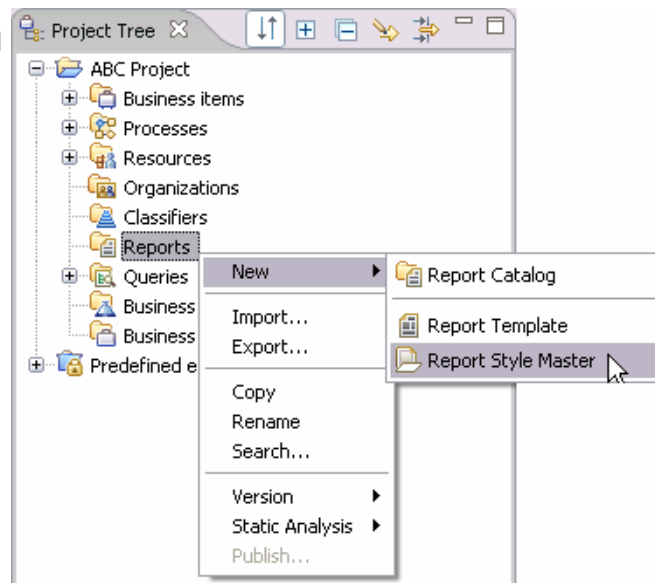

© Copyright IBM Corporation 2009

Figure 6-10. Report designer (2)   WB286 / VB2861.0

Notes:

Report style master (1)

- Report style master enables you to reuse header and footer information for multiple report templates.

- Add your required fields once to a single report style master.
  - Apply that report style master to as many report templates as needed.
  - Every report template will have the same set of header and footer information.

- Report style masters can be applied to predefined or user-defined report templates.

© Copyright IBM Corporation 2009
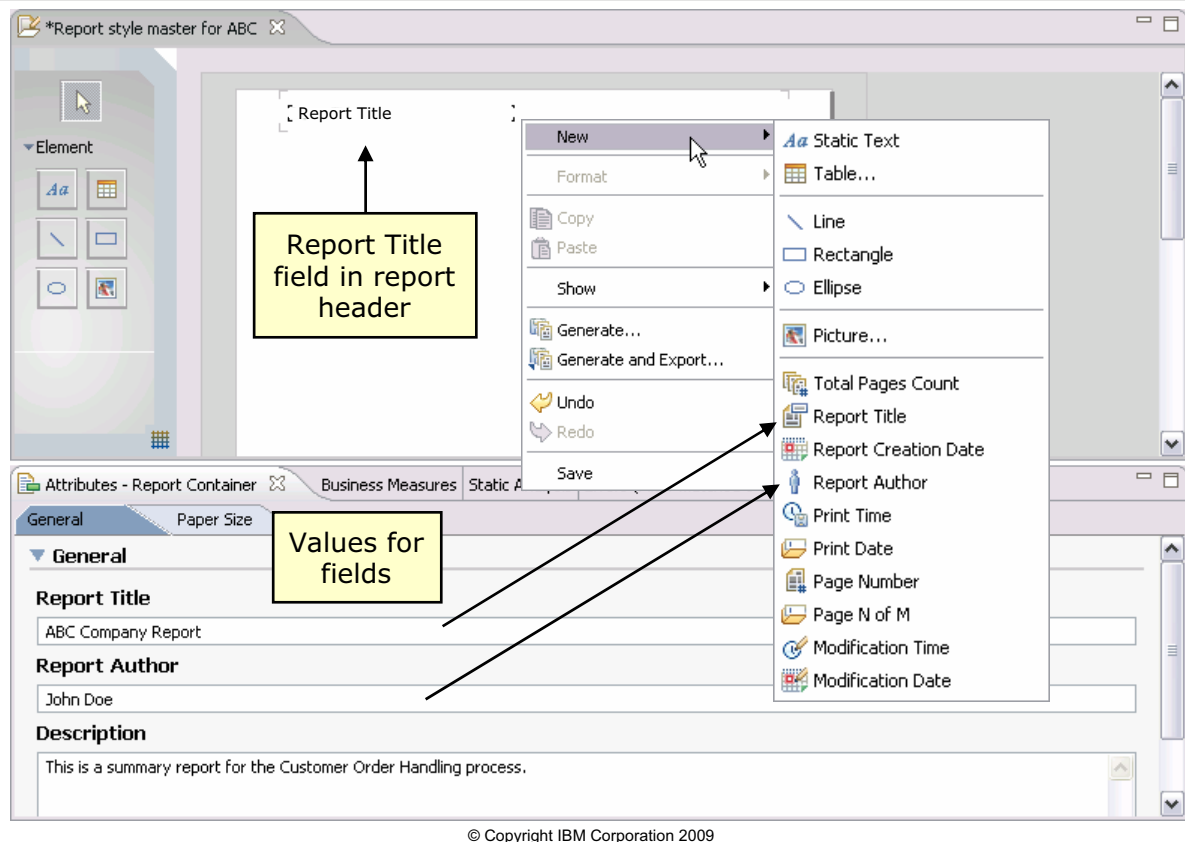
Figure 6-11. Report style master (1)   WB286 / VB2861.0

Notes:

For example, if you want your company name, company logo, and page numbers to appear in all your report templates, you could add those fields to an All Reports style master and then apply that style master to all of your report templates.

Report style master (2)

© Copyright IBM Corporation 2009

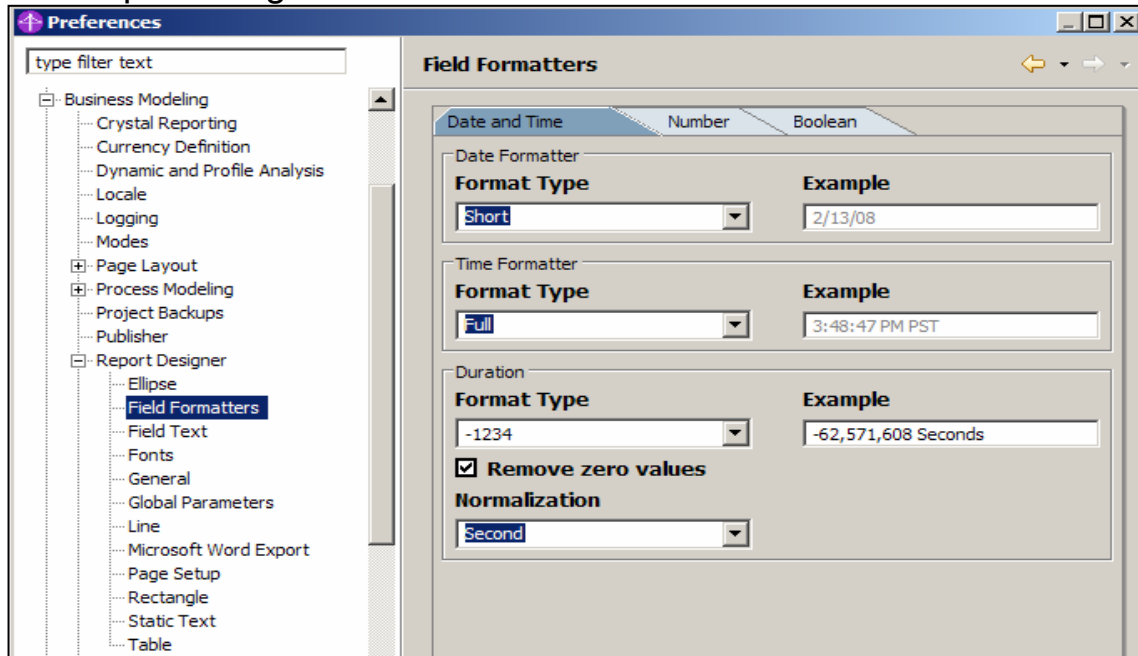Figure 6-12. Report style master (2)   WB286 / VB2861.0

Notes:

Setting report designer preferences

- Setting report preferences
  - Set various preferences to control the default format of elements in the report designer

© Copyright IBM Corporation 2009

Figure 6-13. Setting report designer preferences   WB286 / VB2861.0

Notes:

Queries

- Queries extract and show information on elements of a model.
  - Queries return information about model elements of one specified type.

- Use queries to:
  - Confirm that the content of your models accurately represents your business.
  - Gather required information for making business decisions.
  - Document and disseminate specific types of information.
  - Define the content used for creating reports.

- Query builder is used to create queries.
  - Expressions can be used to get information on specific model elements.
    - For example, create a query that retrieves all the individual resources that have a cost per time unit of $20.00 or less.
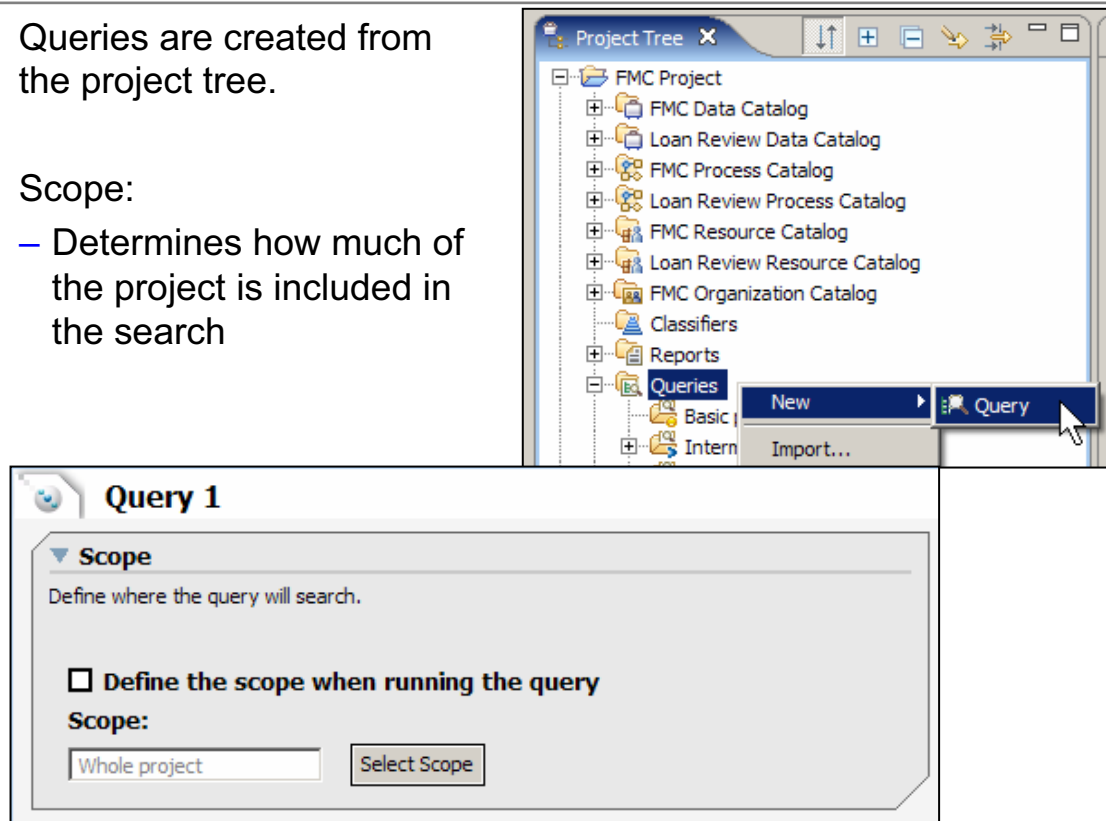
Figure 6-14. Queries WB286 / VB2861.0

Notes:

Creating queries: scope

- Queries are created from the project tree.

- Scope:
  - Determines how much of the project is included in the search

© Copyright IBM Corporation 2009
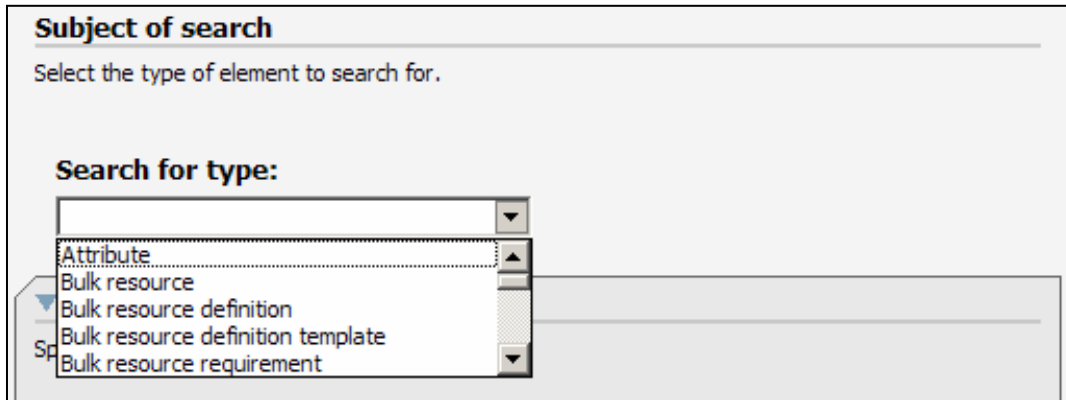
Figure 6-15. Creating queries: scope WB286 / VB2861.0

Notes:

Creating queries: subject of search

- Subject of search
  - Determines which element type to search for

Subject of search

Select the type of element to search for.

Search for type:

```
Attribute
Bulk resource
Bulk resource definition
Bulk resource definition template
Bulk resource requirement
```

Figure 6-16. Creating queries: subject of search   WB286 / VB2861.0

Notes:

Creating queries: expression builder

© Copyright IBM Corporation 2009
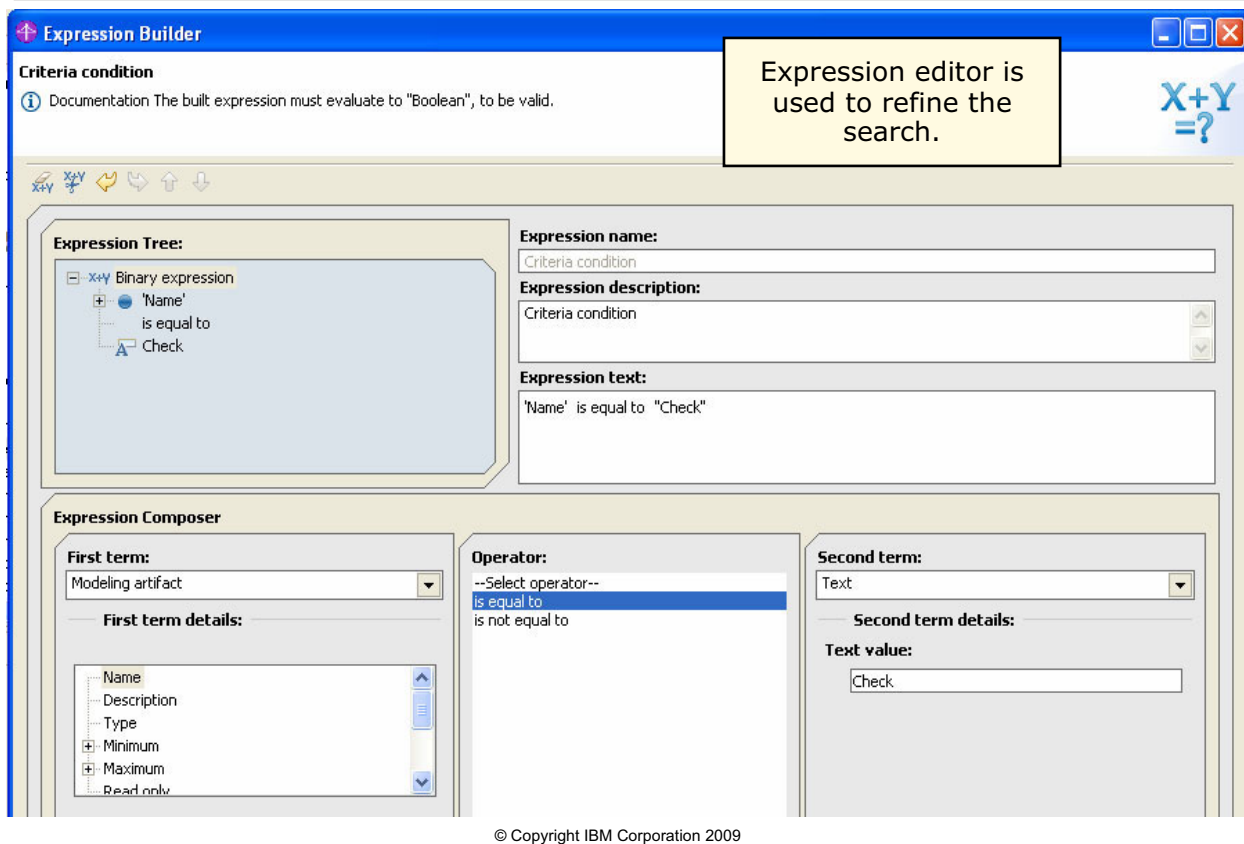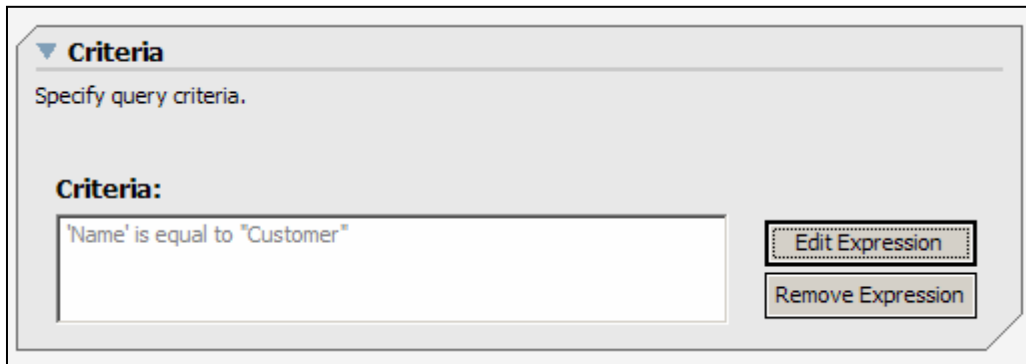
Figure 6-17. Creating queries: expression builder WB286 / VB2861.0

Notes:

Creating queries: define criteria

- Criteria
  - An expression to search for something more specific

Figure 6-18. Creating queries: define criteria WB286 / VB2861.0

Notes:

Creating queries: result definition

- Result definition
    - Defines what will be displayed

Figure 6-19. Creating queries: result definition   WB286 / VB2861.0

Notes:

Running the query

- Run from the Project Tree.
- If the query scope is defined at execution time, the query will prompt you to select a scope.
- The query view displays the query results.
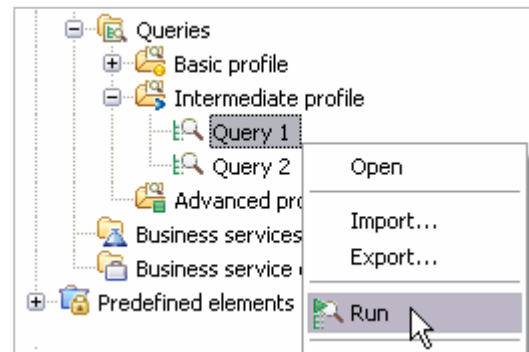
Process Name	Catalog	Global Tasks	Local Tasks	Global Processes	Local Processes	Local Repositories	Global Services	Decisions
Customer Order Han...	Processes	2	8	2	0	0	0	4
Order Verification	Processes	1	2	0	0	0	1	0
Payment Handling	Processes	0	4	0	0	0	0	1

© Copyright IBM Corporation 2009

Figure 6-20. Running the query   WB286 / VB2861.0

Notes:

Using queries in reports

© Copyright IBM Corporation 2009
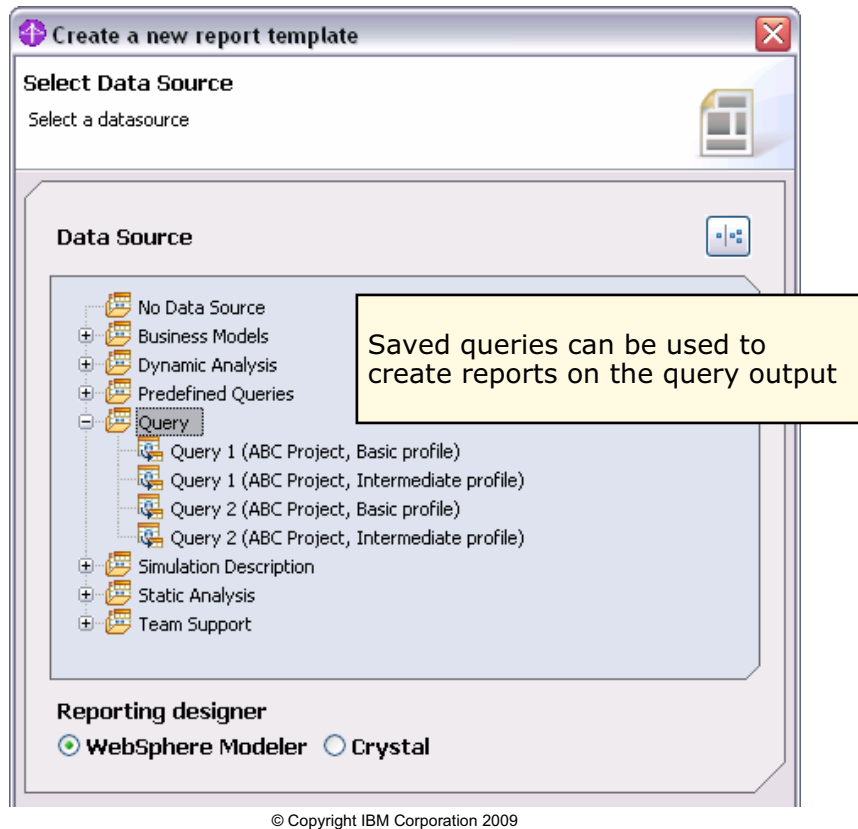
Figure 6-21. Using queries in reports   WB286 / VB2861.0

Notes:

Exporting reports

- Exporting reports allows for the use of the information contained in your models for a variety of purposes.
  - Export documentation reports
  - Export reports that show the results of any type of analysis you run on a model or on simulation results
  - Export reports that show the version history of model elements.
  - Export custom reports based on report templates that were created in the report designer

- Changing text size in generated reports:
  - If the text in a generated report is too large or too small to be useful, it can be changed.
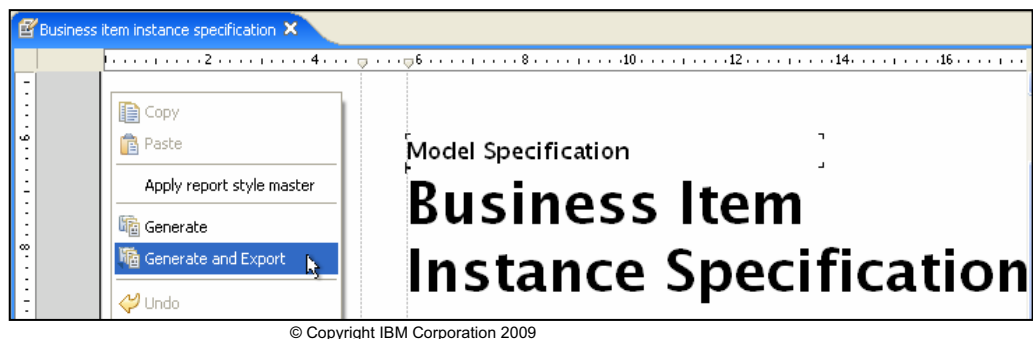
© Copyright IBM Corporation 2009

Figure 6-22. Exporting reports   WB286 / VB2861.0

Notes:

Exporting analysis data

- Export from the analysis view
  - Data exported depend on the type of analysis displayed.

Figure 6-23. Exporting analysis data

WB286 / VB2861.0

Notes:

Crystal Reports

- WebSphere Business Modeler also provides support for Crystal Reports to facilitate the work of organizations that already use this application.
  - Crystal Reports is a separate product from WebSphere Business Modeler.

- Activities related to Crystal Reports:
  - Create new report templates in the Project Tree view, define their content using WebSphere Business Modeler data sources, and start the Crystal Reports design environment to specify the particulars of the report template
  - Copy, rename, and delete report templates
  - Generate and export reports based on existing report templates from the Project Tree view (assuming that Crystal Reports is installed on the local machine)
  - View and print generated reports
  - Import report templates that have been defined by another user
  - Export report templates for use or customization by another user
  - Check in and check out CVS versions of report templates

- WebSphere Business Modeler does not provide any predefined Crystal Reports templates.

© Copyright IBM Corporation 2009

Figure 6-24. Crystal Reports WB286 / VB2861.0

Notes:

WebSphere Business Modeler does not provide any predefined Crystal Reports templates. If you want to use the predefined report templates, you can generate and export them directly from the Project Tree view without using Crystal Reports.

Checkpoint

1. Name some of the categories of data sources used in WebSphere Business Modeler reports?

   _____

2. Which data source would contain information in a repository location of a version control system?

   _____

3. What is the function of the report style master?

   _____

4. What is the purpose of a scope when creating a query?

   _____

Figure 6-25. Checkpoint   WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

3.

4.

Unit summary

Having completed this unit, you should be able to:
• Explain the process of creating custom reports
• Create report templates using data sources
• Export reports
• Use predefined and custom queries

© Copyright IBM Corporation 2009

Figure 6-26. Unit summary

Notes:

Checkpoint solution

1. Name some of the categories of data sources used in WebSphere Business Modeler reports?
   Business models, dynamic analysis, predefined queries, query (user-defined), simulation description, static analysis, team support
2. Which data source would contain information in a repository location of a version control system?
   Team support data sources
3. What is the function of the report style master?
   The report style master enables you to reuse header and footer information for multiple report templates
4. What is the purpose of a scope when creating a query?
   The scope determines how much of the project is to be included in the search

© Copyright IBM Corporation 2009

Figure 6-27. Checkpoint solution   WB286 / VB2861.0

Notes:

:

Exercise overview

In this exercise you will:
• Create a report style master
• Create a report template
• Add report details
• Add a report chart
• Apply a report style master to report

Figure 6-28. Exercise overview   WB286 / VB2861.0

Notes:

Unit 7. Defining business measures

What this unit is about

This unit describes business measures.

What you should be able to do

After completing this unit, you should be able to:

- Describe the purpose of WebSphere Business Monitor
- Describe the various WebSphere Business Monitor dashboards
- Define business measures and model elements
- Describe the capabilities of the Business Measures view in WebSphere Business Modeler

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
- Describe the purpose of WebSphere Business Monitor
- Describe the various WebSphere Business Monitor dashboards
- Define business measures and model elements
- Describe the capabilities of the Business Measures view in WebSphere Business Modeler

© Copyright IBM Corporation 2009

Figure 7-1. Unit objectives WB286 / VB2861.0

Notes:

Creating business measures in WebSphere Business Modeler
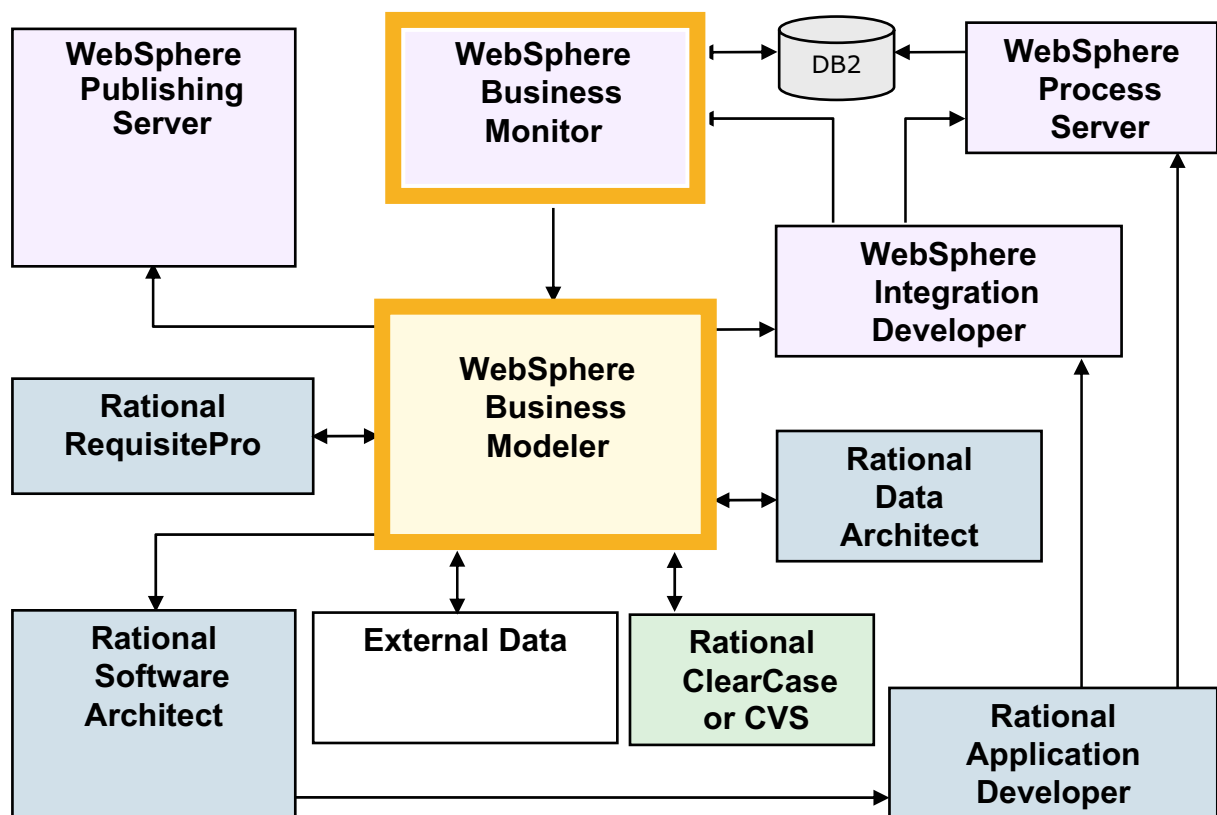
Figure 7-2. Creating business measures in WebSphere Business Modeler WB286 / VB2861.0

Notes:

Why measure business performance?

- Monitor and control business operations

- Drive improvement of process efficiency

- Maximize the effectiveness of the improvement effort

- Achieve organizational goals and objectives

Figure 7-3. Why measure business performance?   WB286 / VB2861.0

Notes:

WebSphere Business Monitor overview

- Captures business-related data
- Displays the measurement values on your dashboard
- Provides business intelligence insight through dimensional analysis and reporting
- Enables you to define actions to take when specified situations occur
- Identifies and notifies you of operation failures for inspection and analysis

© Copyright IBM Corporation 2009
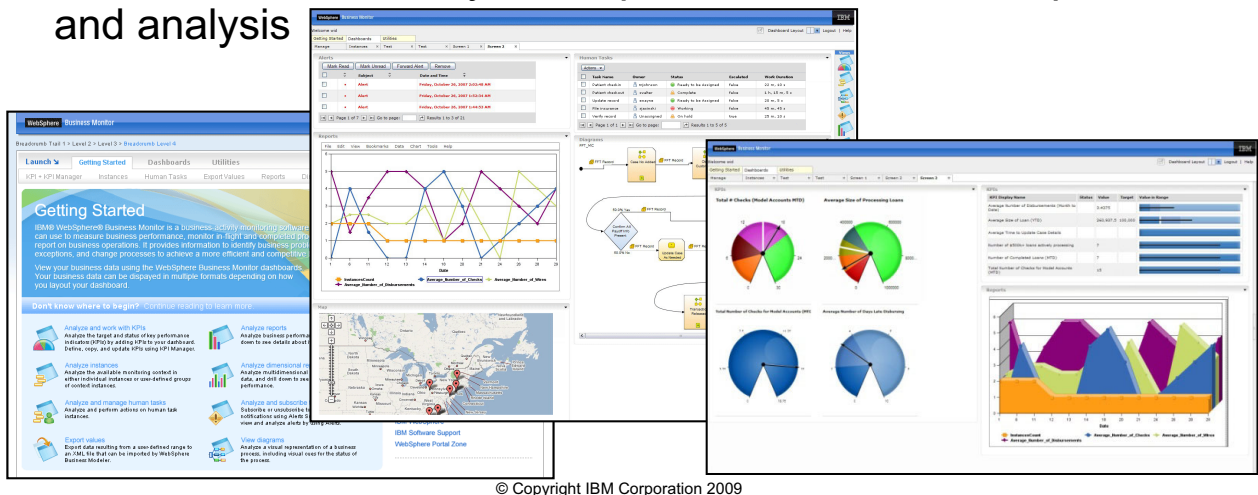
Figure 7-4. WebSphere Business Monitor overview   WB286 / VB2861.0

Notes:

IBM WebSphere Business Monitor is business-activity monitoring software that measures business performance, monitors real-time and completed processes, and reports on business operations. It provides information that helps you to identify business problems, correct exceptions, and change processes to increase business competitiveness by improving process efficiencies.

WebSphere Business Monitor monitors business activities rather than IT events. For example, you can monitor the percentage of approved loans or the amount of profit a product produced this quarter rather than monitoring system response time and service throughput.

WebSphere Business Monitor is part of the IBM WebSphere Business Process Management product suite. Using the product suite, you can model your business processes with WebSphere Business Modeler, run the business process applications on WebSphere Process Server, and monitor the business process with WebSphere Business Monitor. To improve your business processes, WebSphere Business Monitor produces data that can be analyzed with the simulation functions of WebSphere Business Modeler.

For increased flexibility, you can use WebSphere Business Monitor to monitor business activities that have not been modeled using WebSphere Business Modeler. WebSphere Business Monitor is not only able to monitor business process applications running on WebSphere Application Server, WebSphere Process Server, and WebSphere Enterprise Service Bus, it can also monitor business process applications running on WebSphere MQ Workflow and FileNet Business Process Manager, virtually anywhere, if Common Base Events can be generated from their activity.

Use WebSphere Business Monitor to view business metrics and key performance indicators (KPIs). Users interact with Web-based dashboards pages to view current operations as well as previously stored metrics. With the Web-based interface, you can create dashboard pages, add data to the pages, and configure the data to be displayed.

To monitor activities or processes, WebSphere Business Monitor server receives and processes events from business applications. The WebSphere Business Monitor server can subscribe to business events from various sources including WebSphere Process Server and other applications in the business environment. The events that WebSphere Business Monitor server receives reflect your business activity. Information processed from events is stored in the Business Monitor database. Additionally, you can configure the WebSphere Business Monitor server to detect special business situations and manage the resulting actions.

WebSphere Business Monitor dashboards

- Business performance-management dashboards are used to view the financial and operational data of a business.
- The dashboards operate in a near-real-time environment to monitor business situations, allowing users to manage the appropriate actions.
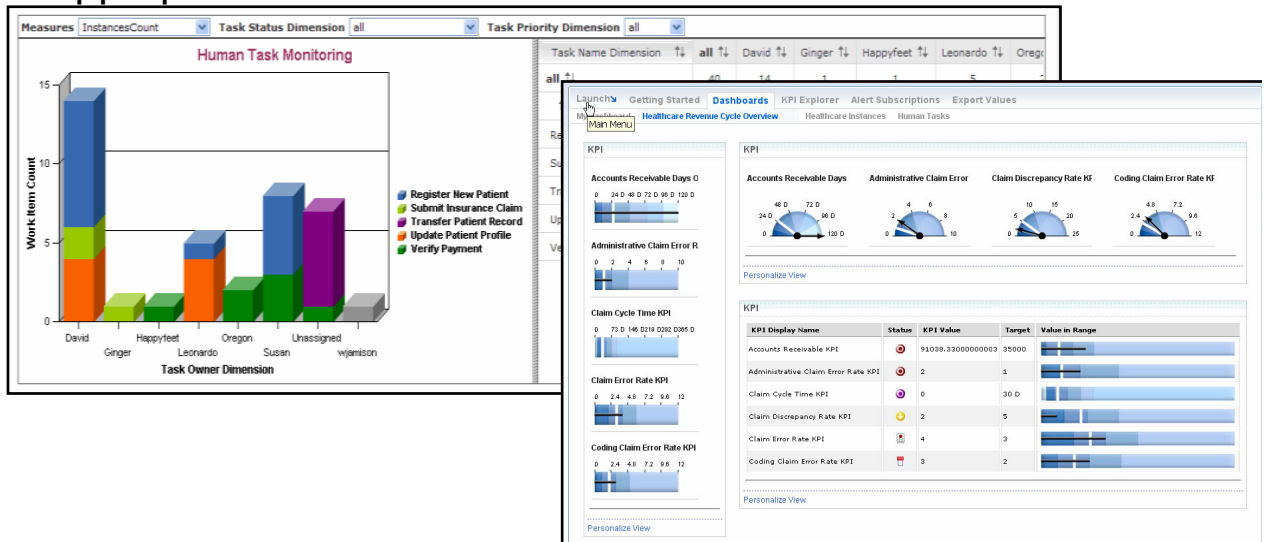
© Copyright IBM Corporation 2009

Figure 7-5. WebSphere Business Monitor dashboards   WB286 / VB2861.0

Notes:

Life cycle of performance measurement
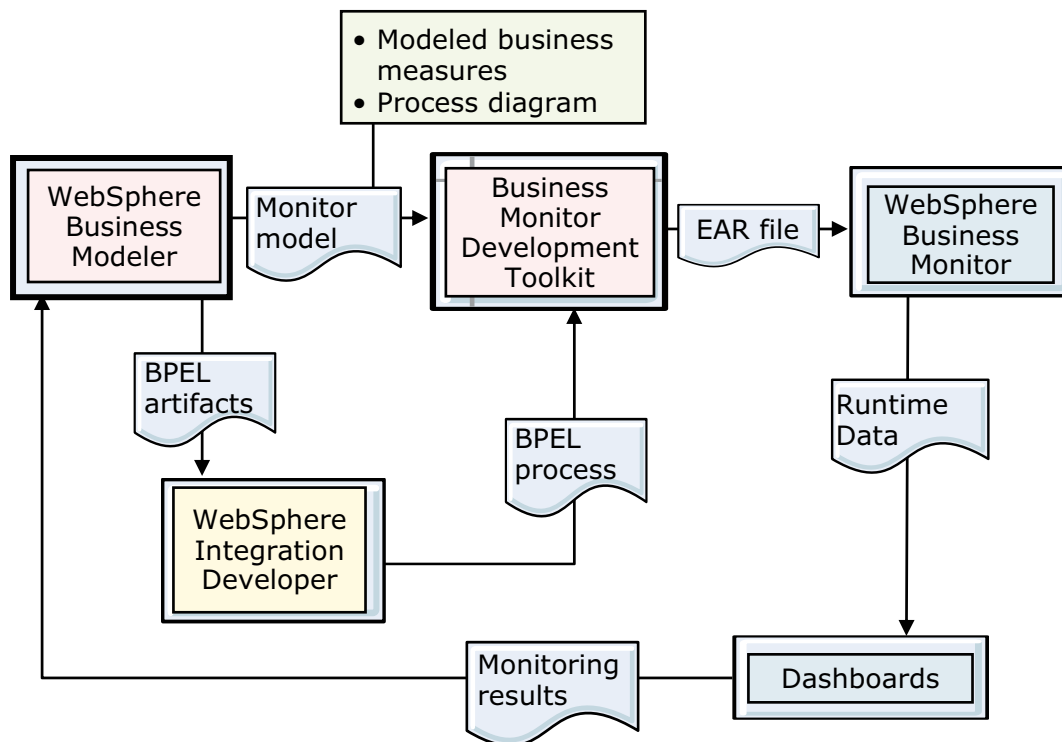
Figure 7-6. Life cycle of performance measurement

Notes:

The WebSphere Business Monitor development toolkit provides technical users with an environment for creating and testing monitor models. Monitor models describe how events should be processed and how information should be collected for use with dashboards.

After modeling the process, a business analyst adds business measures in WebSphere Business Modeler. First, the analyst evaluates the process and the business objectives to determine which business measures will be needed from the executing process. Business measures information that can be specified in WebSphere Business Modeler is separated into two types:

- Information to be used for dashboard display and analysis (specified in the Business Performance Indicators tab).

- Information to collect from running process instances (specified in the Monitored Values tab). This information can be used to improve the accuracy of simulations in WebSphere Business Modeler.

The monitor model that is created during this phase is used to provide guidance to the systems analyst who will complete the implementation of the monitor model in the WebSphere Business Monitor Development Toolkit.

Business process modeling

Business process modeling in WebSphere Business Modeler provides the foundation. A business analyst performs the following tasks:

- Builds and refines the process model

- Simulates "What if?" conditions

- Selects the processes for monitoring

Specify business measures in WebSphere Business Modeler

Starting with a process model in WebSphere Business Modeler, you can specify business measures for performance management.

- Business Measures View: The Business Measures view typically opens by default when you open a process, along with the Attributes view and the Errors view. You can use the Business Measures view to specify the business measures for the process and the monitored values to return to WebSphere Business Modeler.

Export monitor models

You can export a preliminary monitor model from WebSphere Business Modeler to refine in the WebSphere Business Monitor Development Toolkit. After you can deploy to WebSphere Business Monitor. This monitor model provides guidance to the developer who will complete the model, and also includes Scalable Vector Graphics (SVG) diagrams for each process, sub process, and loop.

Implement monitor models

Information is transferred from WebSphere Business Modeler to WebSphere Business Monitor in the form of a monitor model. A monitor model describes business measures (such as metrics and key performance indicators), their dependencies on incoming events, conditions (business situations) warranting business action, and outbound events that represent notifications of such conditions and might trigger business actions.

Import results

Once a monitored process has been executing for some time, you can export the values captured by WebSphere Business Monitor to an XML file and import them into WebSphere Business Modeler for further analysis on the process.

What is a business measure?

- Business measures describe the performance management aspects of a business that are required for real-time business monitoring.
  - They include metrics and key performance indicators (KPIs).
- Process execution results are collected, calculated, and analyzed against business measures using WebSphere Business Monitor.
- Business measures can be used for:
  - Compliance or documentation
  - Redesign
  - Execution
- In a process model, specify the information that you want to monitor by associating business measures with the process.

© Copyright IBM Corporation 2009

Figure 7-7. What is a business measure?   WB286 / VB2861.0

Notes:

Compliance or documentation

Documenting business processes can help businesses to understand them as well as providing documentation that can be used by staff or customers for training. Compliance regulations often have documentation requirements. Linking to real-time monitoring can provide a feedback mechanism for reporting the requirements needed for compliance.

Redesign

Documenting both the current state and future state business process allows for comparisons. Monitoring can help with Return on Investment (ROI) analysis.

Execution

If the future state business process has runtime characteristics associated with it, the monitor model can be passed to application, workflow, and business process development tools.

Business measures in WebSphere Business Modeler

- Business measures in WebSphere Business Modeler provide a way for business analysts to specify what should be monitored when the business process is executing.
  - The business analyst has insight into key elements of the business process that could indicate the success or failure of strategic business goals.
- Business measures can be associated with process elements.
- Predefined and custom business measures can be built.
- The business analyst's specification of what should be monitored is exported to the WebSphere Business Monitor Development Toolkit.
  - The implementation is then completed by the integration developer.
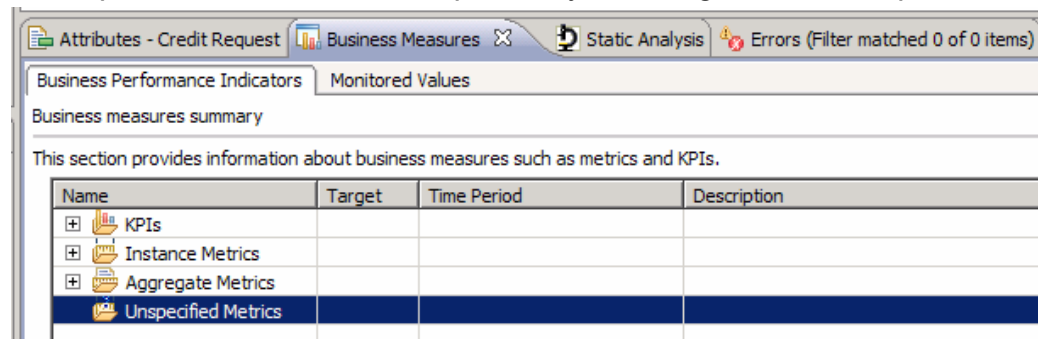
© Copyright IBM Corporation 2009

Figure 7-8. Business measures in WebSphere Business Modeler   WB286 / VB2861.0

Notes:

WebSphere Business Modeler provides a set of business measure templates for commonly monitored business measures.

Monitor model (1)

- Describes business measures such as metrics and key performance indicators (KPIs).

- Specifically describes how to:
  - Gather information from real-time (inbound) events
  - Aggregate information to calculate higher-level business metrics or key performance indicators (KPIs)
  - Represent the calculated values on a number of dashboard views and analysis reports, based on the business needs
  - Recognize business situations
  - Emit situation events that may be used to trigger actions

© Copyright IBM Corporation 2009

Figure 7-9. Monitor model (1)   WB286 / VB2861.0

Notes:

The monitor model is the container of definitions and specification on what and how information is monitored against a process.

Modeler contains a lightweight, Business Analyst-friendly Business Measure Details designer that provides the relevant options for a business user.

The information gathered in this input window is played forward toward the Monitor environment in the form of a Monitor Model.

The Monitor model describes business measures (such as metrics and KPIs), the dependencies on incoming events, conditions (business situations) warranting business action, and outbound events that report specified conditions and warrant an action.

Monitor model (2)

- Specifications are defined in WebSphere Business Modeler's business measures view.
  - Has integrated capability within the process editor
  - Allows users to quickly and easily define KPIs and metrics
  - Targeted at business users

- Technical implementation is performed with the Development Toolkit in WebSphere Integration Developer.

Figure 7-10. Monitor model (2)   WB286 / VB2861.0

Notes:

The monitor model can be exported from WebSphere Business Modeler and then completed in the WebSphere Business Monitor Development Toolkit in WebSphere Integration Developer. The final monitor model (completed in the Monitor Development Toolkit in WebSpher Integration Developer) defines these actions so they can execute in a runtime environment (WebSphere Business Monitor).

Basic monitor model elements

- Metric
  - Represents the value of a monitored item and helps in assessing performance in a particular business area
    - Example: Order processing time
  - Can have numeric values such as the number of items shipped, or non-numeric values such as the delivery dates of shipments

- Key performance indicator (KPI)
  - A quantifiable measure designed to track critical success factors of a business process
  - Example: Orders must be processed within three days
    (Order processing time < 3 days)

© Copyright IBM Corporation 2009

Figure 7-11. Basic monitor model elements   WB286 / VB2861.0

Notes:

Metric

- A holder for information, usually a business performance measurement, in a monitoring context
- Associated with one or more maps that, when evaluated, give the metric a value
- Can be used alone or in combination with other metrics to define the calculation for a key performance indicator (KPI), which measures performance against a business objective
- Examples of metrics:
  - Working duration of a process
  - Name of the user assigned to a task
  - Supplier's response time
  - Cost of the risk assessment step in an insurance process
- Two types
  - **Instance metrics** return the result from one run of the process.
  - **Aggregate metrics** are calculated across multiple runs of the process, for finding the average, maximum, minimum, or total number of occurrences.

Figure 7-12. Metric   WB286 / VB2861.0

Notes:

A metric is a measurement of an aspect of a process or process element that is used to assess business performance. A metric can be used alone or in combination with other metrics to define the calculation for a key performance indicator (KPI), which measures performance against a business objective. A metric is defined within a specific process using WebSphere Business Modeler, and the value of that metric is captured and evaluated using WebSphere Business Monitor.

As an example of an instance metric, you can measure the order cost for each run (each instance) of an order handling process. Typically, each time the order handling process runs, it produces a different result. For example, for three instances of the process, the order costs could look like this:

InstanceOrder cost

1100

2150

3125

Alternatively, you can monitor the process as a whole by applying aggregations over its process instances. For example, if there are three instances of the process with the order costs shown above, you can check the order cost across all instances of the process and calculate the average as follows: (Instance 1 + Instance 2 + Instance 3) / 3 = 125

Aggregate metrics usually use instance metrics and apply a function (maximum, minimum, average, or total) to get a useful result. If you created a Revenue Minus Cost metric, you could have an Average Revenue Minus Cost aggregate metric to hold the average number across multiple runs of the process.

As another example, you may have a Shipping Duration metric that performs a calculation to subtract a Shipping Date metric from an Order Date metric, providing you with the shipping duration for each invoice. To find the average shipping duration across all invoices, you would create an aggregate metric, select "Average" for the aggregation function, and select "Shipping Duration" for the aggregation source. This Average Shipping Duration aggregate metric could be used, in turn, to create a KPI called "Average Shipping Duration < 5 days."

Key performance indicator (KPI)

- KPIs are detailed specifications required to track business objectives.
  - Used in measuring business performance

- Each KPI is associated with a specific process, and is quantifiable, measurable, and results-oriented.

- Two ways of specifying expected values or ranges:
  - Target value with percentage deviation margins
  - Upper and Lower Limits

Figure 7-13. Key performance indicator (KPI)   WB286 / VB2861.0

Notes:

A key performance indicator (KPI) is a type of metric that indicates the degree of business performance.

KPIs are created based on business objectives. A business objective is an executive statement of direction in support of a corporate strategy. The business objective is a high-level goal that is quantifiable, measurable, and results-oriented. For business measures modeling, the business objective is translated into a KPI that enables the organization to measure some aspect of the process against a target that they define. Within WebSphere Business Monitor, the KPI is compared against actual results to determine the level of success.

A KPI is associated with a specific process and is generally represented by a numeric value. A KPI may have a target and allowable margins, or lower and upper limits, forming a range of performance that the process should achieve. A KPI can be thought of as a metric with a target. An example of a simple KPI is: Average time for response to a customer inquiry is less than two days.

As more detailed example, say that an organization sets the following business objectives:

Orders must be processed within three days compared to the current average of five days

Average amount of an order must increase by 10%

To determine if their new process is helping the organization to achieve its business objectives, the business analyst sets and monitors the following KPIs:

- Shipment duration KPI. For the Delivery process, track the order date against the delivery date and monitor when the average time to shipment is within a 20% range of the five days target

- Manual order approval KPI: For the Order Handling process, track the approval durations for manual orders and monitor when maximum approval time exceeds one business day

- Average order amount KPI: For the Customer Order process, track the average amount of each order

KPIs can be made up of one or more metrics. The calculated results of the metrics during process monitoring are used to determine whether the target of the KPI has been met. For example, tracking the average time to shipment might include the following metrics:

- Elapsed time for order completion

- Elapsed time for order approval

- Number of orders received

- Working duration of each task in the process

- Percentage of orders automatically approved

Determining which KPIs are useful, based on the business objectives, is one of the most important tasks involved in the design of effective business dashboards.

Each KPI can have an associated target with margins, or lower and upper limits. The limits and margins indicate a range that the KPI should remain within. What you see in the business dashboards is affected by how you specify the KPIs in WebSphere Business Modeler. You can also add situation events that can be generated when specific conditions are met, and these in turn can trigger business actions.

These are your options for specifying a KPI:

- Specify an exact target and acceptable target variations (defined by lower margin and upper margin), using percentages below and above the target as the margins.

- Specify a safe range (defined by lower limit and upper limit), using specific numeric values as the limits.

For example, if you wanted to specify a lower limit of 40 minutes and an upper limit of 75 minutes, you could do it in either of the following two ways, depending on how you wanted to specify a range or target:

- Using specific numeric values as a safe range:

  - Lower limit: 40 minutes

- **-** Upper limit: 75 minutes
- Using a target and percentages:
  - **-** Exact target: 50 minutes
  - **-** Lower margin: 20% [(50 minutes - (50 minutes * .20)) = 40 minutes]
  - **-** Upper margin: 50% [(50 minutes + (50 minutes * .50)) = 75 minutes]

Dimensions

- Data categories used to organize information for reporting and analysis.

- Process data can be described in terms of:
  - Quantitative data (what is measured or counted)
    - Example: order price, number of sales, shipping time
  - Dimensions (how to divide up, or group the data)
    - Example: customer, address, product

- Dimensions provide a structure that summarizes business measures.

- WebSphere Business Monitor dashboards allow the user to graphically display and interactively analyze this data.

Figure 7-14. Dimensions WB286 / VB2861.0

Notes:

A *dimension* is a data category that is used to organize and select instances for reporting and analysis. For example, a retail business performance might be analyzed by time, products, and stores; for this business, time, products, and stores are dimensions. Each of the dimensions has one or more levels that define the overall hierarchy of the dimension. For example, the time dimension might have year, month, and day levels.

Assume that you have collected data, for example, sales figures for every product your company makes. You then need to retrieve information from this data, and answer the following questions:

- What are the total sales for each product by store?

- Which products are selling best over time?

- Who is your highest-performing salesperson?

Dimension levels

- Dimensions can (optionally) have multiple levels.

- Location
  - Continent
    - Country
      - State/Province
        - > City

- Time
  - Century
    - Year
      - Month
        - > Day

- Product
  - Category
    - Name

Figure 7-15. Dimension levels   WB286 / VB2861.0

Notes:

Consider the following simple Location dimension hierarchy as an example:

- Country

- State/Province

- City

Country is at a higher level than State/Province, which in turn is at a higher level than City.

The Location dimension has levels called Country, State/Province, and City

- Each level enables you to aggregate the levels that are underneath it

- For example at the Country level, you might have the total of all data for all states. Or at the State level, you might have the total of all data for all cities

In the Business Measures editor, you create dimensions and then define aggregation group levels as metrics within those dimensions

- Using the previous example, you would first create a Location dimension

- Within the Location dimension, you would create a Country metric with an aggregation group level of 0, a State metric with a level of 1, and a City metric with a level of 2

Dimensional analysis

- Provides business insight by summarizing business metrics.

- Organizes data into levels of detail that can drilled down to extract significant information.

- Dimensional analysis enables a breakdown of quantitative measures by some grouping (dimension).
  - Typically follows this format: "function" of a "measure" by a "dimension"
    - Examples:
      - Average of Profit by City
      - Total of Order Value by Customer
      - Maximum of Employee Salary by Time

Figure 7-16. Dimensional analysis   WB286 / VB2861.0

Notes:

- Each process can be described in terms of quantitative data, which takes on many values and participates in calculations, and in terms of dimensions, which are entry points for manipulating and analyzing the data in meaningful ways

- In dimensional analysis, quantitative data is what you add up (such as order quantity, cost of order), and dimensions are how you divide your data (such as time, customer, location, product)

- Generally, any measure with non-numeric values is a level of a dimension, and you analyze other measures against dimensions

Predefined business measure templates (1)

- Templates provide definitions of frequently-used business measures.

- Used with instance metrics.
  - Tracks information over a single run of the process

- Templates can be applied to business measures created on top-level processes, tasks, loops, and subprocesses.

Figure 7-17. Predefined business measure templates (1)   WB286 / VB2861.0

Notes:

You can create business measures based on a set of predefined business measure templates. The templates are designed to help you create business measures that are frequently required. For example, you can add a business measure to track the working duration of a task or whether a process is delayed. You can also add a business measure to access the data carried through the process by a business item.

Business measures based on a template are always instance metrics. They track information over a single run of the process.

The name of the business measure is based on the element (top-level process, task, loop, or local subprocess) and the template that you select. For example, if you right-click the Order Received task and create a business measure based on the State template, the business measure is called Order Received State. If you create a business measure based on an Order business item and the Business Item Input template, the business measure is called Order Business Item Input.

If you create a business measure based on a business item input or output, you also select the business item attribute that you want to track. For example, you might have an attribute

that holds the total amount of an order, the number of items in an order, or the customer rating. You might want to change the name based on the attribute that you want to track, for example Order Amount rather than Order Business Item Input.

Templates can be applied to business measures created on top-level processes, tasks, loops, and subprocesses.

Predefined business measure templates (2)

- Available from context menu when right-clicking model element or process.
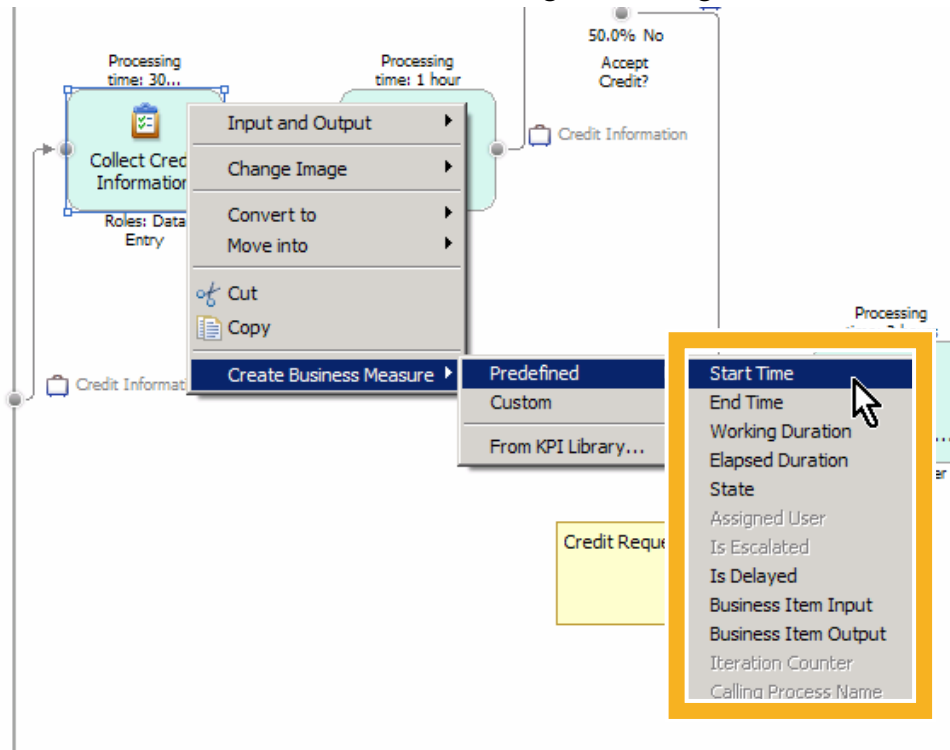
© Copyright IBM Corporation 2009

Figure 7-18. Predefined business measure templates (2)   WB286 / VB2861.0

Notes:

Predefined business measures templates make it easy to capture specific kinds of information, such as the working duration of a task or the value of a specific business item attribute.

You can create business measures directly from the Process editor by right-clicking an element (such as a task, loop, or local subprocess) whose performance you want to track or by right-clicking the background of the process diagram to specify a business measure for the top-level process. You can select an available template from the list of predefined templates or create a custom business measure.

The following predefined templates are provided:

Table 1: Predefined Templates

Name	Value Type	Description
Start time	Date Time	When the current run of the activity started
End time	Date Time	When the current run of the activity ended

Table 1: Predefined Templates

Name	Value Type	Description
Working duration	Duration	Lenght of time that the activity is actively running
Elapsed duration	Duration	Difference between the start time and end time of the activity, which might include idle time as well as processing time
State	Text	Current state of the activity
Assigned user	Text	Name of the user who claims the activity at run time (applicable only to human tasks)
Is escalated	Boolean	Whether a task escalation has taken place (applicable only to human tasks)
Is delayed	Boolean	Whether the activity is delayed
Business item input	Type of the selected business item attribute	Value of an attribute of a business item that is an input to the activity
Business item output	Type of the selected business item attribute	Value of an attribute of a business item that is an output from the activity
Iteration counter	Integer	Number of times a loop runs (applicable only to loops)
Calling process	Text	Name of the process that started this top-level process (applicable only to top-level process)

Predefined business measure templates (3)

© Copyright IBM Corporation 2009

Figure 7-19. Predefined business measure templates (3)   WB286 / VB2861.0

Notes:

After selecting a predefined business measure, the Business Measure Details designer displays.

In this example, a business measure based on the Working Duration template is being associated with the Review Order With Customer task. The name and description were filled in automatically. Remember that predefined business measures can only have the instance metric type.

Custom business measure: key performance indicator (1)

© Copyright IBM Corporation 2009

Figure 7-20. Custom business measure: key performance indicator (1)   WB286 / VB2861.0

Notes:

Custom business measure:
key performance indicator (2)

Figure 7-21. Custom business measure: key performance indicator (2) WB286 / VB2861.0

Notes:

To specify an exact value that the KPI should achieve, click **Specify a target value and type**.

• Select a specific type for the KPI, either **Number** or **Duration**.

• Specify the **Target Value** for the KPI to achieve. If you selected **Number** as the type, you must type a number. If you selected **Duration** as the type, you must select some combination of days, hours, minutes, and seconds. If you did not select a type, the value is optional and can be any text.

To specify a range or set of ranges against which to track the KPI, click **Specify range details**.

To have the target value treated as 100% for setting the ranges, select **Percentage of target value**, or, if you have no target or want to specify exact ranges, select **Actual value**. For example, you might have an Acceptable range that is from 90% to 100% of the target and a Good range that is from 100% to 110% of the target. Or, using actual values, you

might have an Acceptable range that is from 5 to 10 and a Good range that is from 10 to 20.

To add a range, click **Add**. Click the **Range name** cell and type a more meaningful name. Type the start value and end value of the range. For example, if you are trying to achieve a target of 5, you might have a range of 1-4 called Poor, a range of 4-6 called Good, and a range of 6-10 called Excellent.

Custom business measure:
key performance indicator (3)

© Copyright IBM Corporation 2009

Figure 7-22. Custom business measure: key performance indicator (3)   WB286 / VB2861.0

Notes:

To specify the time period for the KPI, click **Specify a time period over which the business measure will be monitored**.

To calculate the KPI based on data from a repeating time period, click **Repeating** and select daily, monthly, quarterly, or yearly. Select whether to evaluate data for the last full period or for the period in progress. For example, if you select daily, then the KPI can either be based on the values up to yesterday, or be based on the values that include the day so far. You can also select a time zone. The default is your current time zone in WebSphere Business Modeler.

To calculate the KPI over a window of time that moves continuously, click **Rolling**. Select minutes, hours, days, or years and enter the number that you want, for example, 10 minutes or 90 days. If you select 90 days, the value of the KPI will be based on the last 90 days up to the current time.

To calculate the KPI over a single time period, click **Fixed** and select the start date and the end date. If you specify a start date only, the KPI is calculated beginning at that date and continuing to the current date. If you specify an end date only, the KPI is calculated from

the time the process is deployed until the end date. Select the time zone. The default is your current time zone in WebSphere Business Modeler.

To add an alert based on the value of the KPI, click **Specify when to send an alert and the action to take as a result**.

- Click **Add**.

- Click the **Alert Description** cell. Describe the conditions under which an alert should be sent and what should happen as a result of the alert. For example, you could type If the value of the KPI dips into the Poor range, send an e-mail to the manager or If the value of the KPI exceeds the target, notify Marketing.

To restrict the set of information that will be used to calculate the value of the KPI at run time, click **Select the dimensions to be used as filters and add the values of interest**. All the dimensions that you have previously added are displayed.

To add a new dimension, click **Add**. Change the default name of the dimension to a dimension name such as Location, Sales Representative, or Product.

To restrict the set of information based on the dimension, select the check box. For example, if you have a City dimension and want to limit the calculation of this KPI to a specific city, you would select the City dimension.

- Type a value to use as the filter value in the **Values to Include** column. For example, for a KPI called Average Order Amount in London, you would type London. For a KPI called Average Order Amount in New York and Los Angeles, you would type New York, Los Angeles.

Custom business measure:
key performance indicator (4)

KPI Data Filter

You can restrict the information that will be included in the calculation of the KPI. For example, for your Sales In London KPI, you could set the data filter name to City and the value to London.

☑ Specify data filters to limit the values included in the calculation of this KPI

Data Filter Name	Instance Metric	Operator	Values to Include		
Credit Request Dimension		equal to			Add
					Remove

> Restrict the set of information that will be used to calculate the value of the KPI at run time

© Copyright IBM Corporation 2009

Figure 7-23. Custom business measure: key performance indicator (4)   WB286 / VB2861.0

Notes:

へ

Custom business measure: instance metric (1)

Business Measure Information

Name: Credit Request Amount

Type: ○ KPI ⦿ Instance metric ○ Aggregate metric ○ Unspecified

Description: This metric measures the value of an attribute of the input to Collect Credit Information.

Type and Default Value

☑ Specify a default value and type

Type: Text

Default value: 10000

Specify a default value

Alerts

You can specify instructions for notification when specific conditions occur. email.

☑ Specify when to send an alert and the action to take as a result

Alert Description
When the credit request amount is less than 100
When the credit request amount is greater than 50000

Add an alert based on the value of the metric

© Copyright IBM Corporation 2009

Figure 7-24. Custom business measure: instance metric (1)   WB286 / VB2861.0

Notes:

Instance metrics capture information across a single run of the process.

To add an alert based on the value of the metric, click **Specify when to send an alert and the action to take as a result**.

- Click **Add**.

- Click the **Alert Description** cell. Describe the conditions under which an alert should be sent and what should happen as a result of the alert. For example, you could type If the Shipping Duration is longer than 10 days, notify the shipping manager.

Custom business measure: instance metric (2)

Specify how aggregate metric will use this instance metric

© Copyright IBM Corporation 2009

Figure 7-25. Custom business measure: instance metric (2)   WB286 / VB2861.0

Notes:

To create an aggregate metric based on the instance metric, click **Specify how to aggregate this measure across multiple runs of the process**. Both the instance metric and the corresponding aggregate metric will be created when you export the business measures.

- Click **Add**.

- Click the **Name** cell and select the name that will be used in the dashboards, such as Average Order Cost or Minimum Shipping Time.

- Click the **Function** cell and select the function that corresponds to the name (such as **Average** or **Minimum**).

To specify data categories that you can use to organize and select data for reporting and analysis, click **Specify the categories that will be available in the dashboards for analysis of the metric**. All of the dimensions that you have previously added are displayed. To add a new dimension, click **Add** and change the default name of the

dimension to a dimension name such as City, Sales Representative, or Product. Any dimensions that you add become available for use in the dashboards.

Custom business measure: aggregate metric (1)

Business Measure Information

Name: Credit Risk

Type: ○ KPI ○ Instance metric ◉ Aggregate metric ○ Unspecified

Business Measure Details | Dashboard Samples

Dashboards present continuously updated business measures data in a graphical format to make it easy to track process performance.

An aggregate metric is calculated across multiple runs of the process, and is used for finding the average, maximum, minimum, total, or the number of occurrences. This type of data can be displayed in the following dashboards:

Dimensions: Provides a multidimensional view of business performance data. Charts and grids present data for analysis against different dimensions.

Reports: Displays performance reports relative to a time axis. Such reports typically contain tables and graphs with textual descriptions of the analysis.

Dimensions

[Bar chart showing values 0-400 across categories: Price, Instances, Orders, Estimates]

© Copyright IBM Corporation 2009

Figure 7-26. Custom business measure: aggregate metric (1)   WB286 / VB2861.0

Notes:

Aggregate metrics are calculated across multiple runs (or instances) of the process so that you can find the average, maximum, minimum, sum, or number of occurrences.

To specify the aggregation function to apply to the underlying instance metric, click **Specify how this measure is aggregated across multiple runs of the process** and select the function. For example, specify **Average** for an Average Order Cost metric or **Minimum** for a Minimum Shipping Time metric. The underlying instance metric will be created by the developer in the Monitor Model editor in the WebSphere Business Monitor development toolkit.

To specify data categories that you can use to organize and select data for reporting and analysis, click **Specify the categories that will be available in the dashboards for analysis of the metric**. All of the dimensions that you have previously added are displayed. To add a new dimension, click **Add** and change the default name of the dimension to a dimension name such as City, Sales Representative, or Product. Any dimensions that you add become available for use in the dashboards.

Custom business measure: aggregate metric (2)

Figure 7-27. Custom business measure: aggregate metric (2)   WB286 / VB2861.0

Notes:

Aggregate metrics are calculated across multiple runs (or instances) of the process so that you can find the average, maximum, minimum, sum, or number of occurrences.

To specify the aggregation function to apply to the underlying instance metric, click **Specify how this measure is aggregated across multiple runs of the process** and select the function. For example, specify **Average** for an Average Order Cost metric or **Minimum** for a Minimum Shipping Time metric. The underlying instance metric will be created by the developer in the Monitor Model editor in the WebSphere Business Monitor development toolkit.

To specify data categories that you can use to organize and select data for reporting and analysis, click **Specify the categories that will be available in the dashboards for analysis of the metric**. All of the dimensions that you have previously added are displayed. To add a new dimension, click **Add** and change the default name of the dimension to a dimension name such as City, Sales Representative, or Product. Any dimensions that you add become available for use in the dashboards.

Custom business measure: unspecified

• Used for communicating additional requirements

Optionally, you can create a business measure by applying a predefined template to a process element.

Template Unspecified

Name

Type ○ KPI ○ Instance metric ○ Aggregate metri ⊙ Unspecified

Description

Only has description field

▼ Dashboards

Select a metric type to display the associated dashboards.

© Copyright IBM Corporation 2009

Figure 7-28. Custom business measure: unspecified   WB286 / VB2861.0

Notes:

Business Measures view: monitored values

- Specify metric categories for monitored elements.
  - Indicates which values to return from WebSphere Business Monitor
- Multiple runs improve accuracy of simulations.
- Values in WebSphere Modeler are updated for goal analysis.

Business Performance Indicators	Monitored Values			

Monitored values

This section indicates which values you want returned from WebSphere Business Monitor after the process has been monitored.

Process Element	Processing Time	Processing Cost	Startup Cost	Revenue
Accept Credit	✓ Average Accep...	☐	✓ Average Acce...	☐
⊞ Accept Credit?				
⊞ Approve Credit?				
Assess Risk	✓ Average Asses...	✓ Average Asse...	☐	☐
Collect Credit Information	✓ Average Collect...	☐	☐	☐
Credit Request	✓ Average Credit ...	✓ Average Credi...	☐	✓ Average Cre...
Reject Credit	☐	☐	✓ Average Reje...	☐
Request Management Approval	☐	☐	☐	☐

Figure 7-29. Business Measures view: monitored values WB286 / VB2861.0

Notes:

Important: Be selective. The number of attributes you select affects performance, so only select the attributes you need.

Exporting business measures

- Business analyst exports a preliminary monitor model from WebSphere Business Modeler.

- Integration developer refines monitor model in the WebSphere Business Monitor development toolkit and then deploys it on WebSphere Business Monitor.
  – Monitor model from WebSphere Business Modeler provides guidance to the developer who will complete the model.

- Once monitored process has been executing for some time, business analyst exports the values captured by WebSphere Business Monitor to an XML file and imports them into WebSphere Business Modeler for further analysis on the process.

© Copyright IBM Corporation 2009

Figure 7-30. Exporting business measures   WB286 / VB2861.0

Notes:

Sharing business measures with Monitor Development Toolkit

- Export using the Business Monitor Development Toolkit (.mm) export type.

- This produces an MM file, along with SVG files for each of the elements selected for export.
  - The exported .svg is specially annotated for use with WebSphere Business Monitor.
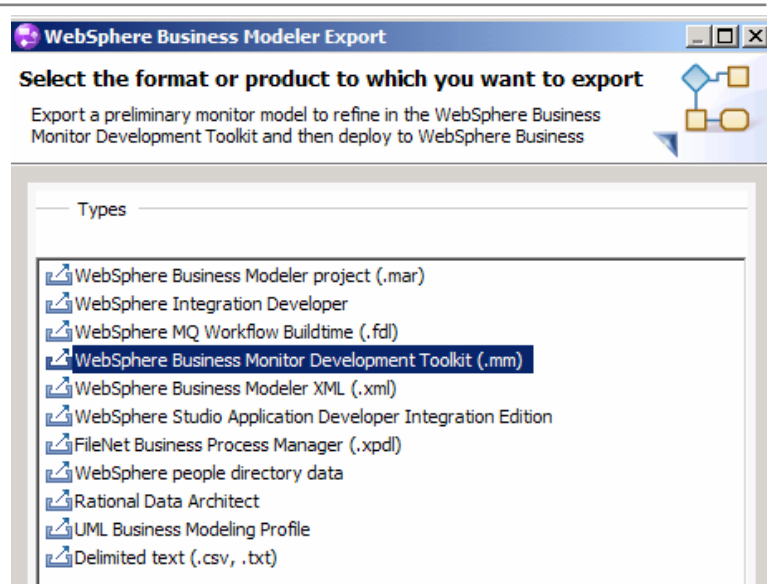
© Copyright IBM Corporation 2009

Figure 7-31. Sharing business measures with Monitor Development Toolkit   WB286 / VB2861.0

Notes:

The implementation is performed in Monitor Development Toolkit
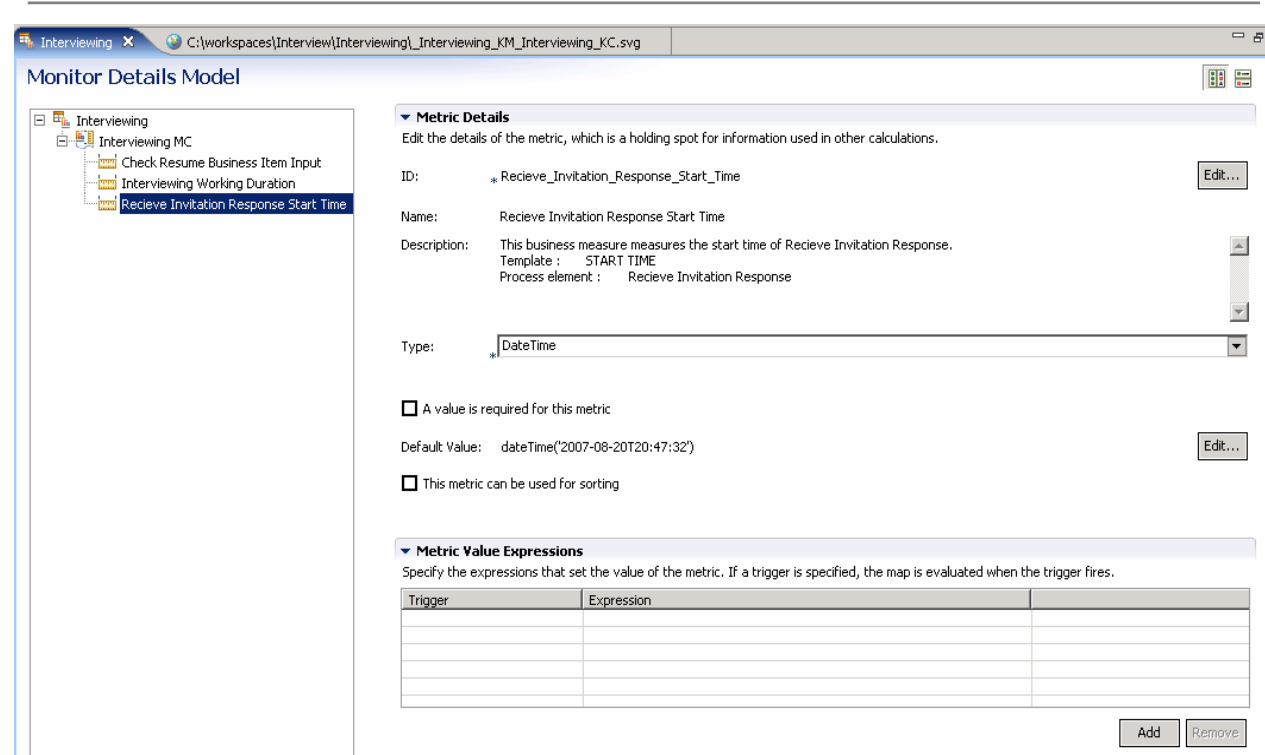
© Copyright IBM Corporation 2009

Figure 7-32. The implementation is performed in Monitor Development Toolkit   WB286 / VB2861.0

Notes:

Key information from the WebSphere Business Modeler is brought over, such as the default timestamp in this case but the implementation is left to the integration developer.

Importing results from WebSphere Business Monitor

- Aggregated values from monitored process can be exported as an XML file and imported into WebSphere Business Modeler.

- Useful for simulation.
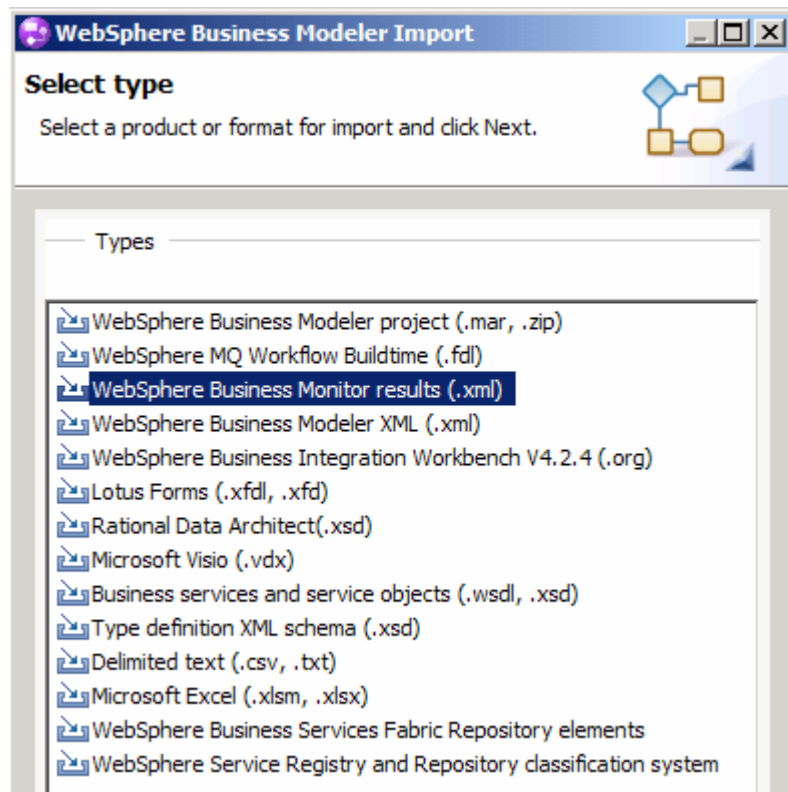
© Copyright IBM Corporation 2009

Figure 7-33. Importing results from WebSphere Business Monitor   WB286 / VB2861.0

Notes:

Once a monitored process has been executing for some time, you can export the values captured by WebSphere Business Monitor to an XML file and import them into WebSphere Business Modeler for further analysis on the process.

Before you can import information, you must have used the **Monitored Values** tab to specify the values to collect in WebSphere Business Monitor. You must have exported a process from WebSphere Business Modeler and run it in WebSphere Business Monitor, and the process that you exported must still be available in the Project Tree view in WebSphere Business Modeler.

Checkpoint

1. Why it is important to measure business performance?
   _____

2. What are the main elements in a business measures model?
   _____

3. What is a key performance indicator (KPI)?

   _____

Figure 7-34. Checkpoint   WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

3.

Unit summary

Having completed this unit, you should be able to:
- Describe the purpose of WebSphere Business Monitor
- Describe the various WebSphere Business Monitor dashboards
- Define business measures and model elements
- Describe the capabilities of the Business Measures view in WebSphere Business Modeler

© Copyright IBM Corporation 2009

Figure 7-35. Unit summary WB286 / VB2861.0

Notes:

Checkpoint solution

1. Why it is important to measure business performance?
   Business measures can be used to monitor and control business operations, drive improvement of process efficiency, and achieve organizational goals and objectives
2. What are the main elements in a business measures model?
   Key performance indicators and metrics
3. What is a key performance indicator (KPI)?
   KPIs are used in measuring business performance that are detailed specifications required to track business objectives.

Figure 7-36. Checkpoint solution   WB286 / VB2861.0

Notes:

Exercise overview

In this exercise you will:
- Define business measures for Credit Request process
- Specify the following measures
  - Key Performance Indicators (KPI)
  - Instance metrics
  - Aggregate metrics
  - Monitored values

Figure 7-37. Exercise overview WB286 / VB2861.0

Notes:

Unit 8. Exporting from WebSphere Business Modeler

What this unit is about

This unit describes the export from WebSphere Business Modeler.

What you should be able to do

After completing this unit, you should be able to:

- Describe the various types of exports from WebSphere Business Modeler:

    - WebSphere Business Modeler project

    - WebSphere Integration Developer

    - WebSphere MQ Workflow buildtime

    - WebSphere Business Monitor Development Toolkit

    - WebSphere Business Modeler XML

    - WebSphere Studio Application Developer Integration Edition

    - FileNet Business Process Manager

    - Rational Data Architect

    - UML Business Modeling Profile

    - Delimited text

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:

• Describe the various types of exports from WebSphere Business Modeler:

– WebSphere Business Modeler project
– WebSphere Integration Developer
– WebSphere MQ Workflow buildtime
– WebSphere Business Monitor Development Toolkit
– WebSphere Business Modeler XML
– WebSphere Studio Application Developer Integration Edition
– FileNet Business Process Manager
– Rational Data Architect
– UML Business Modeling Profile
– Delimited text

© Copyright IBM Corporation 2009

Figure 8-1. Unit objectives   WB286 / VB2861.0

Notes:

Exporting data from Modeler
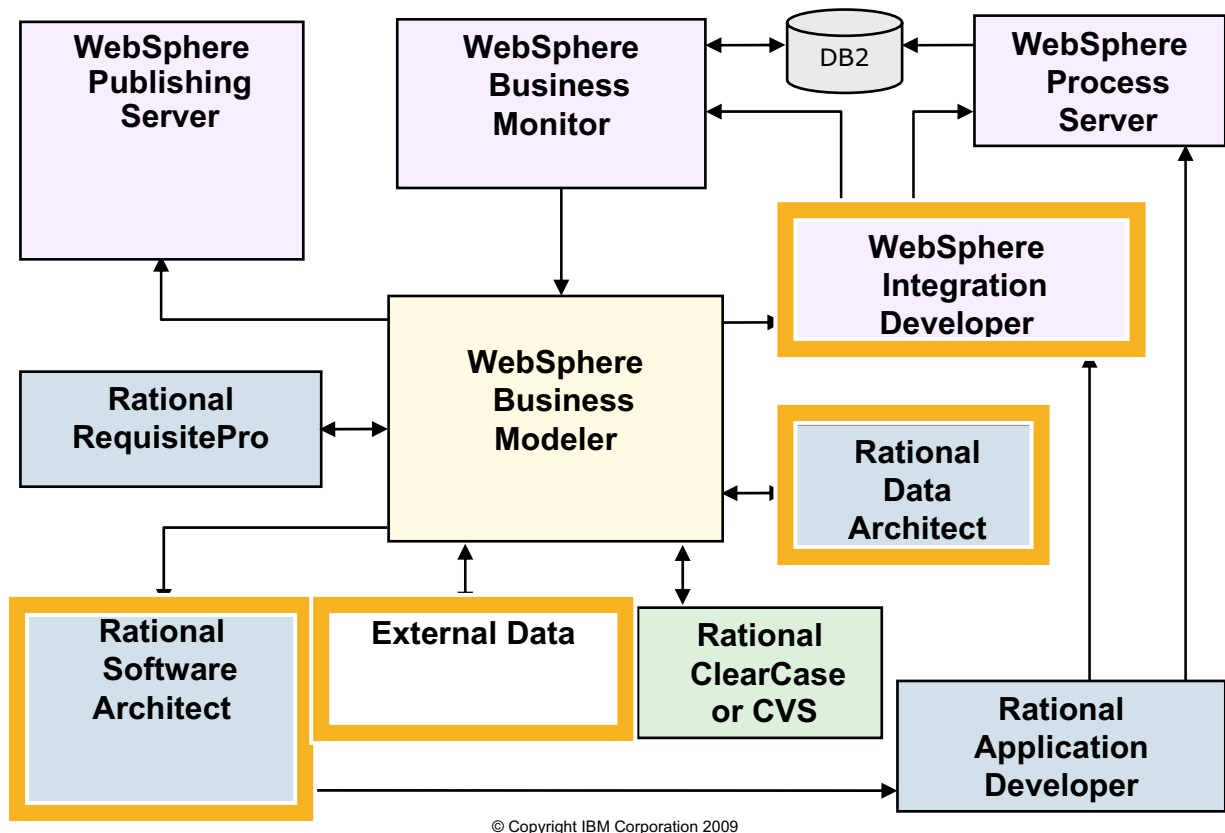
Figure 8-2. Exporting data from Modeler WB286 / VB2861.0

Notes:

Modeler export

WebSphere Business Modeler Export

Select the format or product to which you want to export

Export model elements to a MAR file to back up your model or to import the elements into other workspaces.

Types

- WebSphere Business Modeler project (.mar)
- WebSphere Integration Developer
- WebSphere MQ Workflow Buildtime (.fdl)
- WebSphere Business Monitor Development Toolkit (.mm)
- WebSphere Business Modeler XML (.xml)
- WebSphere Studio Application Developer Integration Edition
- FileNet Business Process Manager (.xpdl)
- Rational Data Architect
- UML Business Modeling Profile
- Delimited text (.csv, .txt)

© Copyright IBM Corporation 2009

Figure 8-3. Modeler export   WB286 / VB2861.0

Notes:

Exporting models to different formats (1)

- WebSphere Business Modeler project
  - Exports the selected project or elements into a MAR file
- WebSphere Integration Developer
  - Exports Service Component Architecture (SCA) artifacts and Business Process Execution Language (BPEL), Web Services Description Language (WSDL), and XML Schema Definition (XSD) files that can be imported into WebSphere Integration Developer to create an implementation for WebSphere Process Server
- WebSphere MQ Workflow Buildtime
  - Exports the selected project or element into a FlowMark Definition Language (FDL) file
- WebSphere Business Monitor Development Toolkit
  - Exports to an MM (monitor model) file and to two or more SVG files
- WebSphere Business Modeler XML
  - Exports the selected project or element into an XML file

© Copyright IBM Corporation 2009

Figure 8-4. Exporting models to different formats (1)   WB286 / VB2861.0

Notes:

Exporting models to different formats (2)

- WebSphere Studio Application Developer Integration Edition
  - Exports the selected project or elements into BPEL, WSDL, and XSD files. These files can then be imported into IBM WebSphere Studio Application Developer Integration Edition.
- FileNet Business Process Manager
  - Exports the selected process or process catalog as XPDL files. These files can then be opened with the Process Designer of FileNet P8 to create implementations for the FileNet P8 runtime environment.
- Rational Data Architect
  - Exports the selected business objects into XSD files. These files can then be imported into Rational Data Architect through the use of an XML to LDM transform.
- UML Business Modeling Profile
  - Exports the selected project or elements into a UML 1.4 XMI 1.1 file.
- Delimited text
  - Exports the selected project or element into a text file.

© Copyright IBM Corporation 2009

Figure 8-5. Exporting models to different formats (2)   WB286 / VB2861.0

Notes:

WSBPEL: Business Process Execution Language

- WSBPEL is also referred to as BPEL.
  - Industry standard for Web services choreography
  - Published by IBM, Microsoft, and BEA (plus SAP and Siebel)
- Language describes simple or complex exchanges that characterize business partner interactions.
- Defines control elements for workflow.
- Creates a fully-executable, portable script.
- Modeler can export process models to WebSphere Integration Developer. It includes files in three formats: BPEL (Business Process Execution Language), WSDL (Web Services Description Language), and XSD (XML Schema Definition). These files import to WebSphere Integration Developer to develop executable application code.

© Copyright IBM Corporation 2009

Figure 8-6. WSBPEL: Business Process Execution Language WB286 / VB2861.0

Notes:

Export to BPEL

- For each process, one BPEL and one WSDL file are created
  - If the process references a global process, task, or services, additional WSDL files are created for each
- XSD files are created for business items used within the process
- The generated files are placed in subdirectories based on the catalog hierarchy of the process and business items

```
Process1.bpel - Notepad
File  Edit  Format  View  Help
<?xml version="1.0" encoding="UTF-8"?>
<bpws:process xmlns:bpws="http://schemas.xmlsoap.org/ws/2004/03/business-process/" xmlns:ns="http:/,
   <bpws:import importType="http://schemas.xmlsoap.org/wsdl/" location="Process1Interface.wsdl" names
   <bpws:import importType="http://schemas.xmlsoap.org/wsdl/" location="../../Project1/processes/pro
   <bpws:partnerLinks>
      <bpws:partnerLink myRole="Process1Service" name="Process1Partner" partnerLinkType="ns:Process1P
   </bpws:partnerLinks>
   <bpws:flow name="Process1_Flow" wpc:displayName="Process1_Flow" wpc:id="-1420992655">
      <bpws:receive createInstance="yes" name="Process1_InputCriterion" operation="InputCriterion" par
         <wpc:output/>
      </bpws:receive>
      <bpws:reply name="Process1_OutputCriterion" operation="InputCriterion" partnerLink="Process1Part
         <wpc:input/>
      </bpws:reply>
   </bpws:flow>
</bpws:process>
```

© Copyright IBM Corporation 2009

Figure 8-7. Export to BPEL   WB286 / VB2861.0

Notes:

BPEL diagram in IBM WebSphere Integration Developer
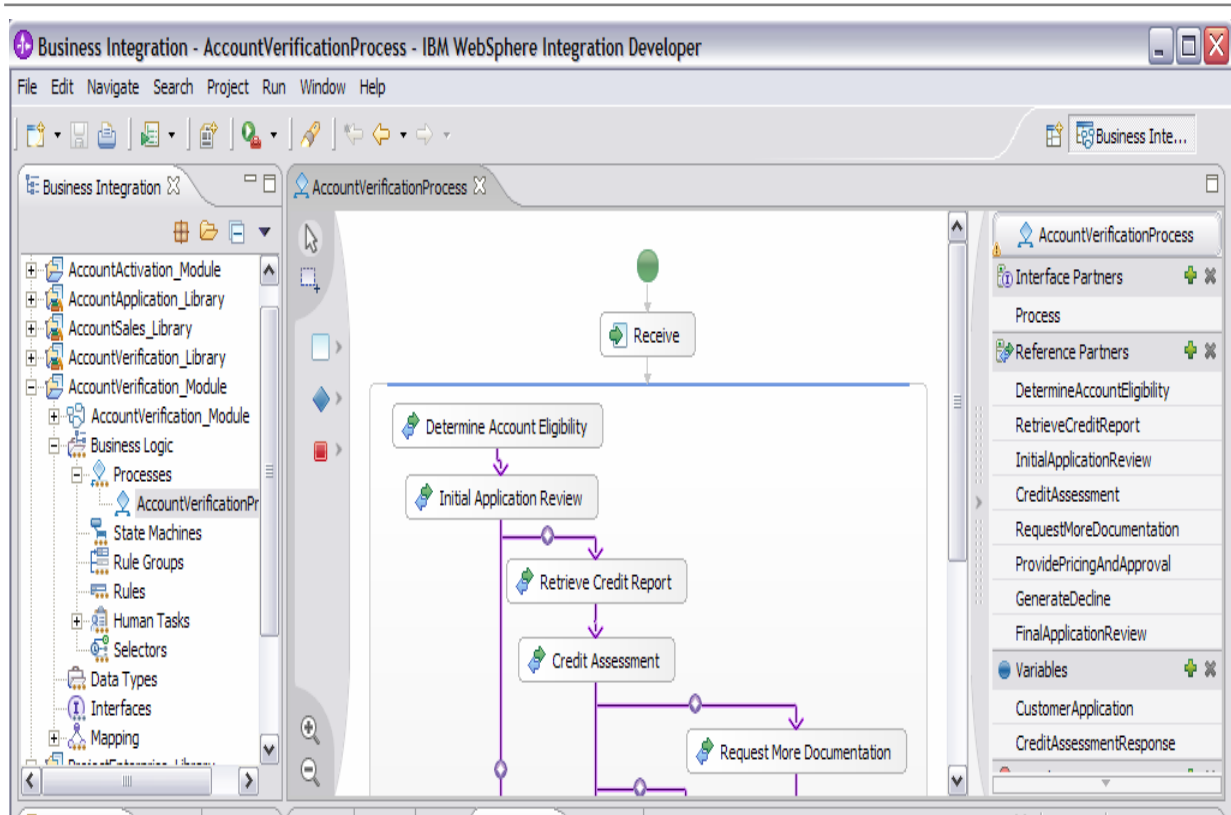
© Copyright IBM Corporation 2009

Figure 8-8. BPEL diagram in IBM WebSphere Integration Developer WB286 / VB2861.0

Notes:

FDL: FlowMark Definition Language

- FDL:
  - Defines all possible paths through the Business Process including the rules that define which paths should be taken and all actions that need to be performed
- WebSphere Business Modeler continues to export processes as FDL for import into WebSphere MQ Workflow.
- Use of FDL as a modeling language is superseded by WSBPEL.

© Copyright IBM Corporation 2009

Figure 8-9. FDL: FlowMark Definition Language   WB286 / VB2861.0

Notes:

Transformation into MQ Workflow Buildtime
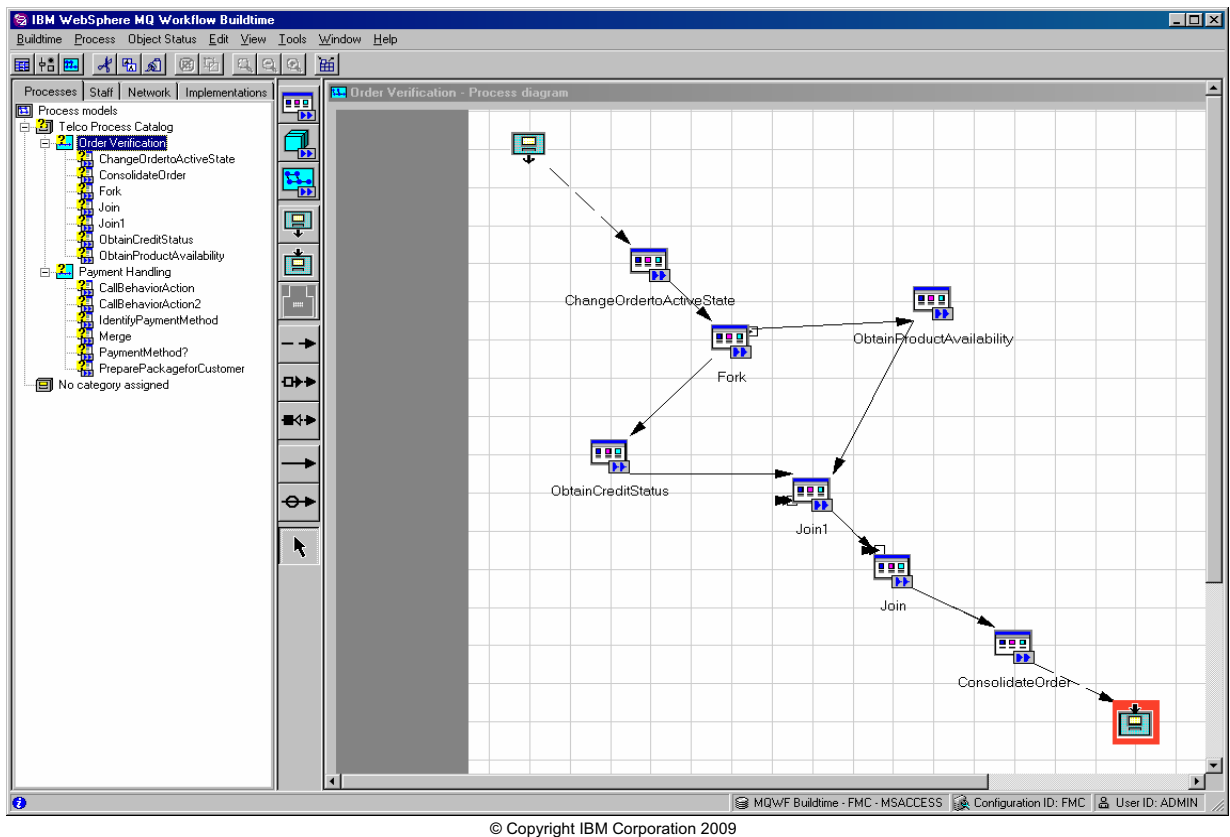
© Copyright IBM Corporation 2009

Figure 8-10. Transformation into MQ Workflow Buildtime   WB286 / VB2861.0

Notes:

This graphic shows a model that has been imported from modeler (now represented in the form of MQ Workflow) and which can have technical items added.

FDL elements not supported

The following FDL elements are not generated when exporting from Modeler to FDL files:
- Process attributes
  - Global container
  - Process administrator
  - Duration of process
  - Control setting (Control tab settings on process: audit trail, notification mode, etc)
  - Activity setting (Activity tab settings on process)
- Program/Process activity attributes
  - Execution setting (Execution tab setting on program/process activity: execution server, and so on)
  - Expiration
  - Tools
  - Notification
  - Control setting (Control tab settings on program/process activity)
  - System (on process activity)
- Connector
  - Data loop connector
  - Default connector
  - Default data connector (generated only for an empty activity)
- Network
  - Anything related to network topology (such as UPES or queue manager) is not supported
- Program
  - Programs are not supported (an empty program is generated for any program activity that is generated)
- Visuals
  - Visual information is not exported

Figure 8-11. FDL elements not supported WB286 / VB2861.0

Notes:

This is a reference slide for those who will be using MQ workflow; it describes what is generated and what is not generated.

Export UML from Modeler

- Either export the entire project or specific objects.
- Two options for export:
  - Role-based swimlanes partitions in the UML Activity Graph to be created for each role
  - Or, Resource-based swimlanes partitions in the UML Activity Graph to be created for each resource
- After export, an XML file will be created using the name of the project, and the file extension is XML.
- The XML file can be imported into Rational Software Architect.
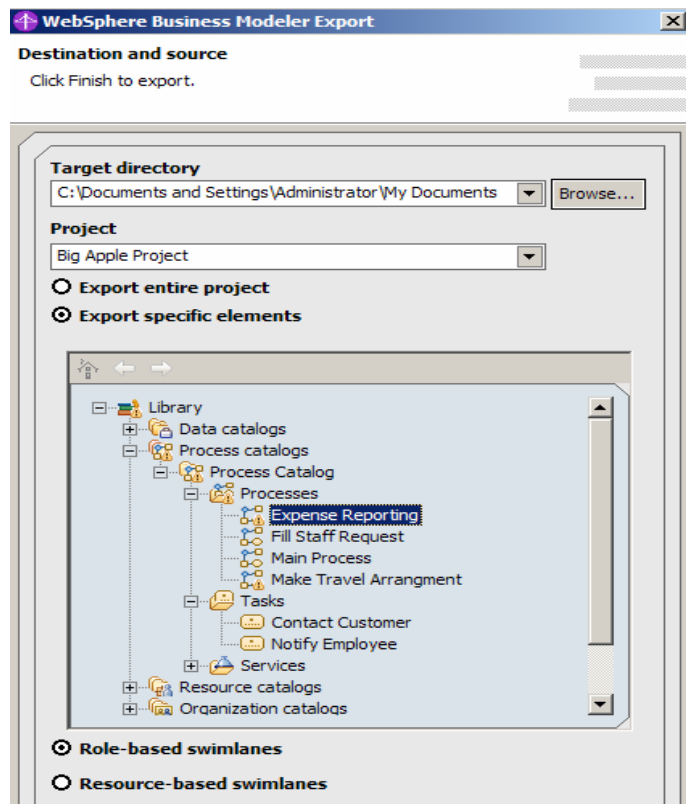
© Copyright IBM Corporation 2009

Figure 8-12. Export UML from Modeler   WB286 / VB2861.0

Notes:

Export to UML for application development

- Export models to UML file which can be imported into IBM Rational XDE.

- Modeler elements are mapped to UML constructs and saved to an XML file.

- Each data definition is mapped to a UML Class, and each process is mapped to a UML Use Case and associated with a UML Activity Graph to represent the process flow.

Modeler

XML file

Rational XDE

Activity Diagram
Use Case
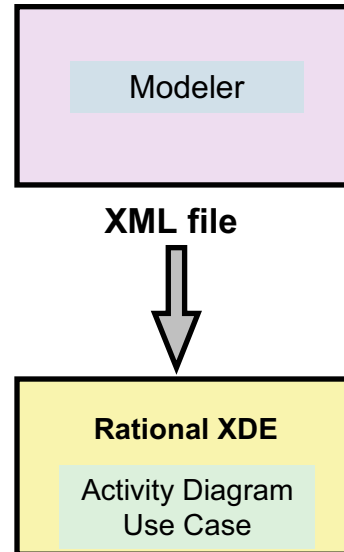
Figure 8-13. Export to UML for application development   WB286 / VB2861.0

Notes:

Rational XDE has the following key features and benefits:

- Single design-to-code experience

- Automatic or manual code synchronization

- User-definable patterns and code templates to automate repetitive coding tasks

- Multiple model support

- Free-form modeling to enhance diagrams with pictures, shapes, and colors

- Database modeling and synchronization

- Web publishing and report generation

Display activity diagram in Rational XDE
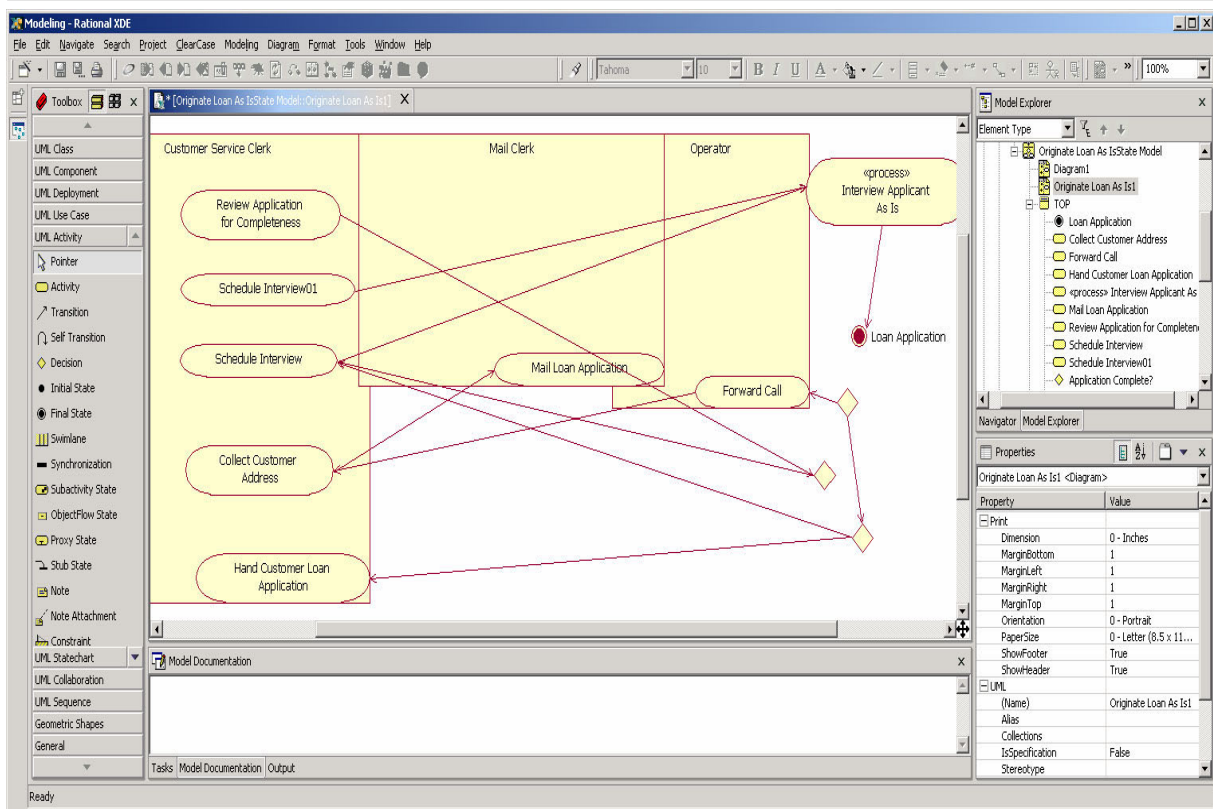
© Copyright IBM Corporation 2009

Figure 8-14. Display activity diagram in Rational XDE   WB286 / VB2861.0

Notes:

FileNet Business Process Manager mode

- Prevents the addition of unsupported process elements
  - Observers
  - Timers
  - Notification broadcasters
  - Notification receivers
  - Global tasks
  - Global services
  - Global repositories
  - Business services
- Marks pre-existing unsupported elements as errors
- Requires expressions for all decision choices

🖥 Basic	Alt+Ctrl+B
🖥 Intermediate	Alt+Ctrl+I
🖼 Advanced	Alt+Ctrl+A
🖳 WebSphere Business Integration Server Foundation	Alt+Ctrl+S
🖭 WebSphere MQ Workflow	Alt+Ctrl+M
✔ 🖸 FileNet Business Process Manager	Alt+Ctrl+F
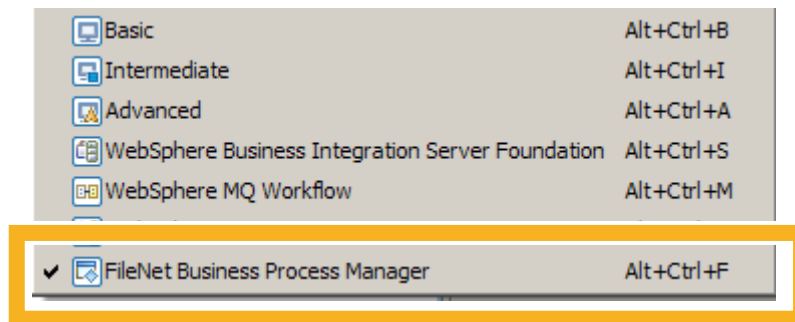
© Copyright IBM Corporation 2009

Figure 8-15. FileNet Business Process Manager mode   WB286 / VB2861.0

Notes:

Once you switch to the FileNet Business Process Manager Mode in Modeler, the FileNet validation will apply.

Modeler: integration with FileNet

- Enables user to create processes in WebSphere Business Modeler and then import them into FileNet Business Process Manager for further refinement and execution.

- FileNet Business Process Manager modeling mode:
  - Supports creating FileNet-compatible process models that can be exported into the FileNet Business Process Manager by validating processes
  - Marks elements that do not have an equivalent in FileNet.
  - Exports processes as XPDL and XSD files which can then be imported into the FileNet Business Process Manager

- User should have extensive experience using WebSphere Business Modeler Advanced and FileNet Business Process Manager.

© Copyright IBM Corporation 2009

Figure 8-16. Modeler: integration with FileNet   WB286 / VB2861.0

Notes:

IBM FileNet Business Process Manager is a separate product; it is not packaged with WebSphere Business Modeler.

The FileNet Business Process Manager mode provides additional validation to the Advanced Business Modeling mode to support creating a model that can be successfully imported into the FileNet P8 platform.

IBM FileNet Business Process Manager

- Standard-based process modeling for business
  - Supports Business Process Modeling Notation (BPMN)
  - Read and produce process definition in XML Process Definition Language (XPDL) format
- 100% Web-based tool
  - easily accessible while minimizing deployment costs
- Process Simulation
  - based on real execution data or assumed scenarios
- Integrated content management
  - Process flows are primarily document-driven
- Versioning and collaboration support
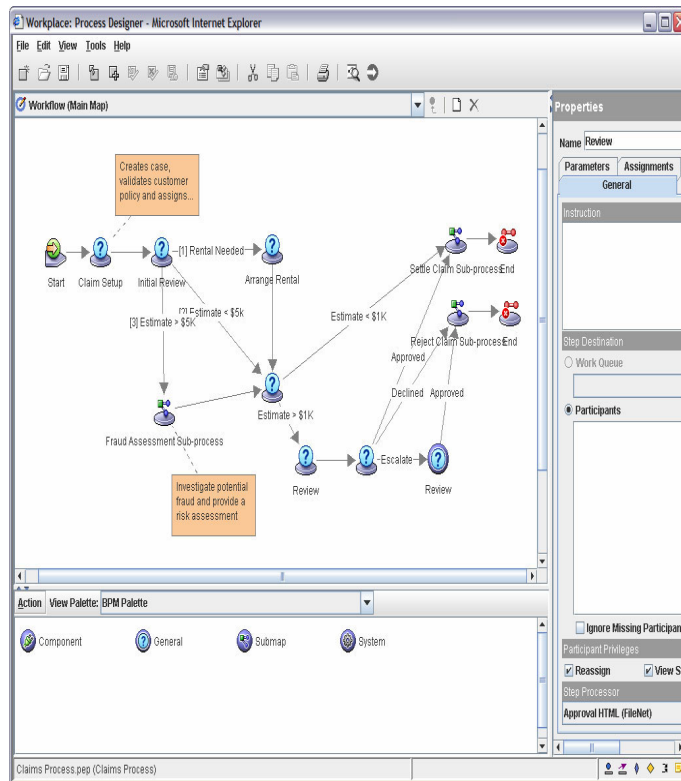 - Supports rapid deployment of improved processes while minimizing the impact on normal operations

© Copyright IBM Corporation 2009

Figure 8-17. IBM FileNet Business Process Manager WB286 / VB2861.0

Notes:

Business Process Manager is an Enterprise Content Management (ECM) solution that allows companies and government agencies to automate, streamline and optimize their complex business processes. With this solution, processes supporting millions of transactions and thousands of users can be quickly deployed and easily modified so organizations can better respond to changing conditions.

IBM FileNet Business Process Manager automates and optimizes business processes by managing workflow and content among people and systems.

The XML Process Definition Language (XPDL) is a format standardized by the Workflow Management Coalition (WfMC) to interchange Business Process definitions between different workflow products like modeling tools and workflow engines. XPDL defines a XML schema for specifying the declarative part of workflow.

IBM FileNet Business Process Manager: Process Designer
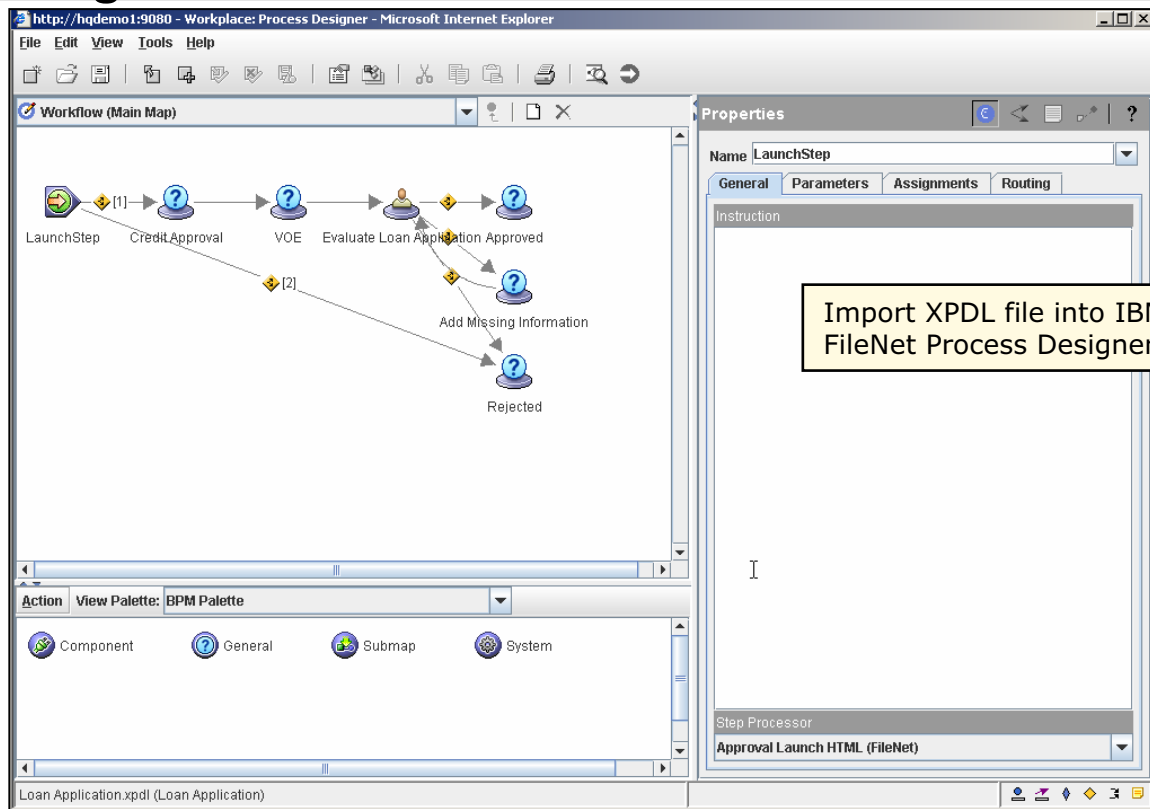
© Copyright IBM Corporation 2009

Figure 8-18. IBM FileNet Business Process Manager: Process Designer   WB286 / VB2861.0

Notes:

Delimited text export

- Elements that can be exported
  - Business items
    - File name of business item adds " _bi.txt"
  - Business item templates
    - File name of business item template adds " _bit.txt"
- Attributes that are not supported:
  - Expressions (used in rules and in default values)
  - Complex types
- Roles are referred to as "qualifications" in the exported delimited text files.

Figure 8-19. Delimited text export WB286 / VB2861.0

Notes:

Checkpoint

1. Name some of the export formats supported by WebSphere Business Modeler.

   _____

2. Name some of the delimited text attributes that are not supported by the Modeler export.

   _____

Figure 8-20. Checkpoint   WB286 / VB2861.0

Notes:

Write your answers here:

1.

2.

Unit summary

Having completed this unit, you should be able to:

• Describe the various types of exports from WebSphere Business Modeler:

– WebSphere Business Modeler project
– WebSphere Integration Developer
– WebSphere MQ Workflow buildtime
– WebSphere Business Monitor Development Toolkit
– WebSphere Business Modeler XML
– WebSphere Studio Application Developer Integration Edition
– FileNet Business Process Manager
– Rational Data Architect
– UML Business Modeling Profile
– Delimited text

© Copyright IBM Corporation 2009

Figure 8-21. Unit summary   WB286 / VB2861.0

Notes:

Checkpoint solution

1. Name some of the export formats supported by WebSphere
   Business Modeler.
   WebSphere Business Modeler project
   WebSphere Integration Developer
   WebSphere MQ Workflow buildtime
   WebSphere Business Monitor Development Toolkit
   WebSphere Business Modeler XML
   WebSphere Studio Application Developer Integration Edition
   FileNet Business Process Manager
   Rational Data Architect
   UML Business Modeling Profile
   Delimited text
2. Name some of the delimited text attributes that are not
   supported by the Modeler export.
   Expressions (used in rules and in default values) and
   complex types

Figure 8-22. Checkpoint solution   WB286 / VB2861.0

Notes:

Exercise overview

In this exercise you will:
- Switch from Advance mode to WebSphere Process Server mode
- Examine and correct errors
- Export your ABC project in a format that can be imported into WebSphere Integration Developer

Figure 8-23. Exercise overview WB286 / VB2861.0

Notes:

Unit 9. Course review

What this unit is about

This unit describes the Modeler course summary.

What you should be able to do

After completing this unit, you should be able to:

- Explain the key concepts that were covered in this course

How you will check your progress

- Checkpoint
- Lab exercises

References

None

Unit objectives

After completing this unit, you should be able to:
• Explain the key concepts that were covered in this course

© Copyright IBM Corporation 2009

Figure 9-1. Unit objectives

Notes:

What is process simulation?

- Simulation:
  - The imitative representation of the functioning of one system or process by means of the functioning of another (a computer simulation of an industrial process). — Merriam-Webster

- Process simulation:
  - Using a computer program based on a set of mathematical formulas to imitate the behavior of a business process to determine how it behaves under different conditions.
  - If the model behaves in the same manner as the real process:
    - There is a good chance that the underlying variables are correct.
    - The model can be used to test the impact of changing conditions.

- Process simulation is a simulated performance of a real-world business process in a virtual environment.
  - The business process might be a model of:
    - An existing business process.
    - One that is planned for the future.

© Copyright IBM Corporation 2009

Figure 9-2. What is process simulation?   WB286 / VB2861.0

Notes:

Simulation terminology

- Simulation snapshot
  - A record of the model that will be simulated
- Simulation profile
  - A record of the model plus the simulation attributes
- Statistics and results
  - The information that comes out of the simulation
- Probabilities or expressions
  - The way decisions are handled during simulation
- Tokens
  - Represent units of work passing through the process
- Process instances
  - Each execution of a process in a simulation
- Process cases
  - Each path through a process
- Random number generation
  - The introduction of real-life variability into a simulation

© Copyright IBM Corporation 2009

Figure 9-3. Simulation terminology WB286 / VB2861.0

Notes:

Element behavior in simulation

- Process time and cost
  - Accumulates the attributes of all the included element attributes
  - Uses the process attributes if there are no elements inside
- Service time and cost
  - Uses the service attributes to determine how it performs work
- Task and map
  - Uses its attributes to determine the time and cost of its work
- Timer, broadcaster, receiver, repository, timetable
  - Uses the attributes to affect the behavior of the process
- Decisions, merges, forks and joins
  - Uses attributes to affect the flow of the process through probabilities or expressions
- Roles and resources
  - Determines time and cost based on specified allocations
  - Resource attributes take precedence over role attributes

Figure 9-4. Element behavior in simulation

WB286 / VB2861.0

Notes:

Simulation snapshot

- The simulation snapshot opens in a tab over the process editor
  - Snapshot name
    - Rename to document settings
  - Simulation attributes
    - Define the simulation behavior
  - Token animation
    - Watch the movement of tokens
    - Look for bottlenecks
  - Activity color
    - Changes color when active
  - Instances
    - Displays number of instances
  - Queue
    - Number of tokens waiting
    - Each bar represents two tokens
  - Animation is not necessary
    - Turning off shortens execution time
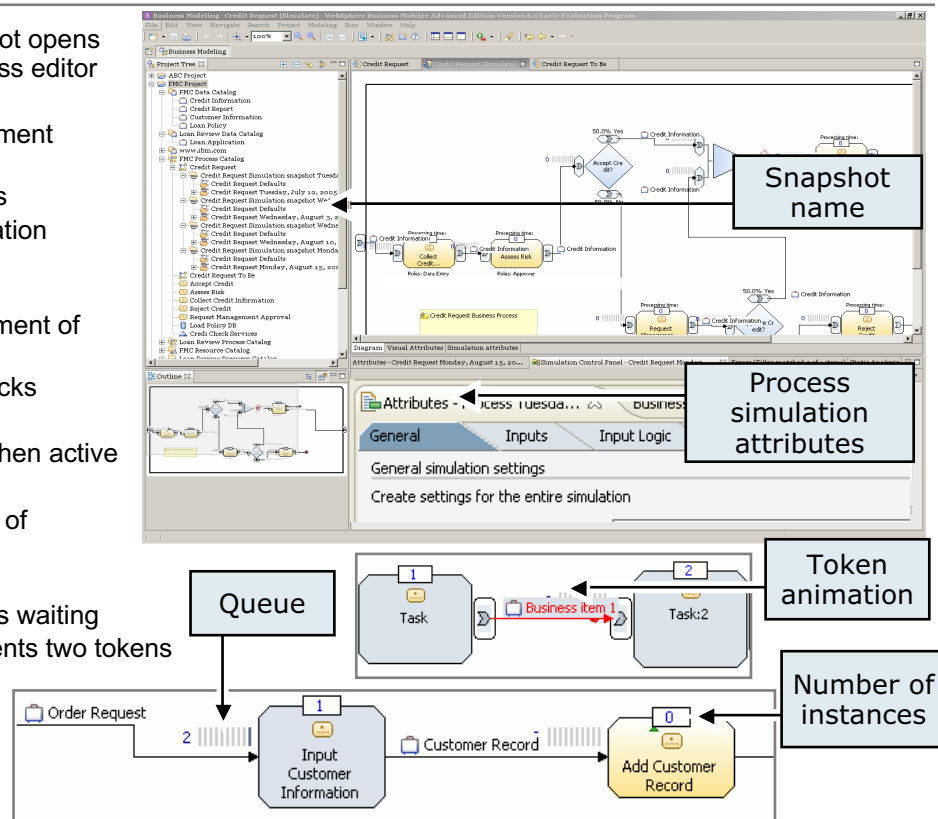
© Copyright IBM Corporation 2009

Figure 9-5. Simulation snapshot   WB286 / VB2861.0

Notes:

Dynamic analysis

- Profile analysis
  - Profile specification
  - Cases summary

- Dynamic analysis
  - Aggregated
  - Process instance
  - Process cases
  - Processes comparison

© Copyright IBM Corporation 2009

Figure 9-6. Dynamic analysis WB286 / VB2861.0

Notes:

Process goal analysis

- Process goals are derived from specific organization goals and customer requirements
  - Organizations achieve their goals through the operations of their processes

- Process goal analysis is used to analyze a process to determine how well it supports the organization's goals
  - The performance of the process is analyzed and evaluated against its goals
  - Allows the focus to be set on increasing the probabilities of process cases that support organizational goals
    - Therefore, it reduces the probabilities of cases that do not support goals

Figure 9-7. Process goal analysis

Notes:

Redesign analysis

- Shows the effects of adding tasks to, or deleting tasks from, a process during the redesign phase

- Use redesign analysis when you need to:
  - Identify improvement opportunities within a process
  - Measure the effects of redesigning a process

Figure 9-8. Redesign analysis WB286 / VB2861.0

Notes:

Custom reports

- Reports are a formatted presentation of information relating to a model or to the results of analyzing a process simulation
  - Predefined report details
    - Numerous predefined reports available in the product
  - Custom reports — report designer
    - Report catalogs
      - Organize report templates for different projects or uses
    - Report templates
      - Produce detailed reports with specific content in a specified format
    - Report style masters
      - Reuse header and footer content for multiple report templates

- Crystal Reports
  - Alternative way of creating and generating report templates

Figure 9-9. Custom reports   WB286 / VB2861.0

Notes:

Business measures in WebSphere Business Modeler

- Business measures in WebSphere Business Modeler provide a way for business analysts to specify what should be monitored when the business process is executing.
  - The business analyst has insight into key elements of the business process that could indicate the success or failure of strategic business goals.
- Business measures can be associated with process elements.
- Predefined and custom business measures can be built.
- The business analyst's specification of what should be monitored is exported to the WebSphere Business Monitor Development Toolkit.
  - The implementation is then completed by the integration developer.
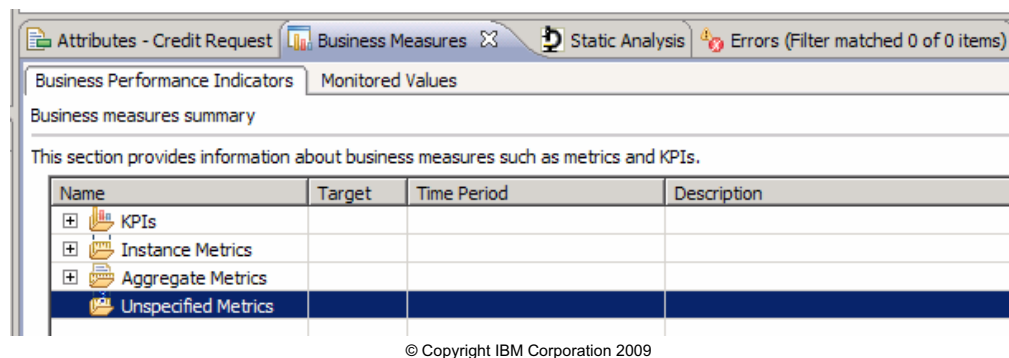

© Copyright IBM Corporation 2009

Figure 9-10. Business measures in WebSphere Business Modeler WB286 / VB2861.0

Notes:

WebSphere Business Modeler provides a set of business measure templates for commonly monitored business measures.

Basic monitor model elements

- Metric
    - Represents the value of a monitored item and helps in assessing performance in a particular business area
        - Example: Order processing time
    - Can have numeric values such as the number of items shipped, or non-numeric values such as the delivery dates of shipments

- Key performance indicator (KPI)
    - A quantifiable measure designed to track critical success factors of a business process
    - Example: Orders must be processed within three days
      (Order processing time < 3 days)

Figure 9-11. Basic monitor model elements

Notes:

Exporting models to different formats (1)

- WebSphere Business Modeler project
  - Exports the selected project or elements into a MAR file
- WebSphere Integration Developer
  - Exports Service Component Architecture (SCA) artifacts and Business Process Execution Language (BPEL), Web Services Description Language (WSDL), and XML Schema Definition (XSD) files that can be imported into WebSphere Integration Developer to create an implementation for WebSphere Process Server
- WebSphere MQ Workflow Buildtime
  - Exports the selected project or element into a FlowMark Definition Language (FDL) file
- WebSphere Business Monitor Development Toolkit
  - Exports to an MM (monitor model) file and to two or more SVG files
- WebSphere Business Modeler XML
  - Exports the selected project or element into an XML file

© Copyright IBM Corporation 2009

Figure 9-12. Exporting models to different formats (1)   WB286 / VB2861.0

Notes:

Exporting models to different formats (2)

- WebSphere Studio Application Developer Integration Edition
  - Exports the selected project or elements into BPEL, WSDL, and XSD files. These files can then be imported into IBM WebSphere Studio Application Developer Integration Edition.
- FileNet Business Process Manager
  - Exports the selected process or process catalog as XPDL files. These files can then be opened with the Process Designer of FileNet P8 to create implementations for the FileNet P8 runtime environment.
- Rational Data Architect
  - Exports the selected business objects into XSD files. These files can then be imported into Rational Data Architect through the use of an XML to LDM transform.
- UML Business Modeling Profile
  - Exports the selected project or elements into a UML 1.4 XMI 1.1 file.
- Delimited text
  - Exports the selected project or element into a text file.

Figure 9-13. Exporting models to different formats (2)   WB286 / VB2861.0

Notes:

Modeler's relationship with other products covered in this course
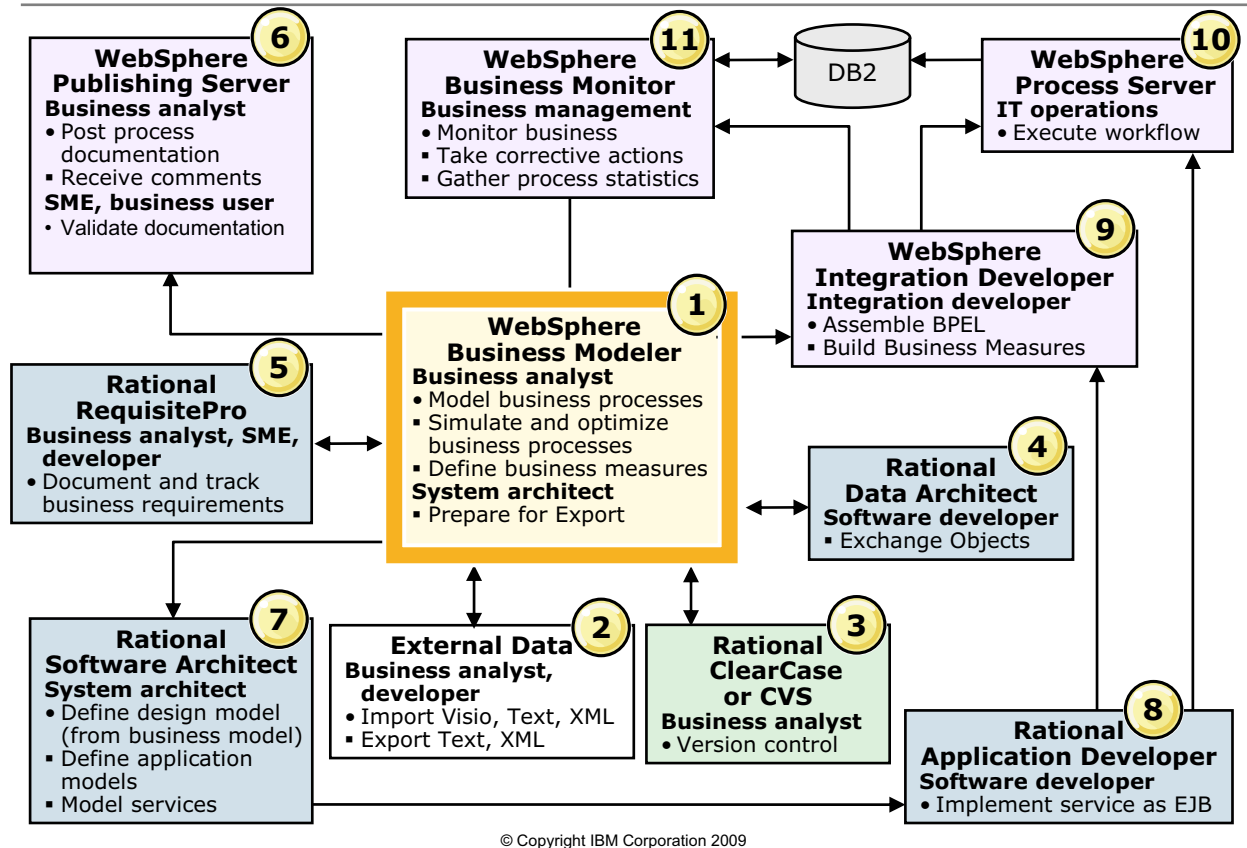

Figure 9-14. Modeler's relationship with other products covered in this course   WB286 / VB2861.0

Notes:

This slide shows the integration between WebSphere Business Modeler and other IBM and non-IBM products. The numbers on this slide do NOT represent a sequence of events.

1. A process model is built using existing information or future design information in WebSphere Business Modeler.

2. Supporting information can be imported (existing Visio models, business items, business services) to support the development of the model.

3. Versions of the process model are stored in a repository for security and control using Rational ClearCase or CVS.

4. Additional IT information can be imported from Rational Data Architect to support development.

5. Business requirements are synchronized with the process model using Rational RequisitePro.

6. Models are exported to WebSphere Publishing Server for review (using a Web browser) during development and later in production.

7. When the new process is ready for development, UML models for building new services are exported to Rational Software Architect.

8. Once the software design is done, the code is developed in Rational Application Developer and exported for further development and execution.

9. Workflow code is developed in WebSphere Integration Developer using the BPEL code generated from the model and using the WSDLs interfaces that were developed. The completed code is exported for execution and monitoring.

10. The workflow code is executed on WebSphere Process Server and production data is exported for monitoring and reporting.

11. Production data is monitored by management using WebSphere Business Monitor. Production data can be exported from WebSphere Business Monitor and imported into WebSphere Business Modeler for future analysis.

Additional materials in your class image

- Clean lab workspaces
  - Lab workspaces that you can re-do your lab exercises
- Industry samples
  - Banking, Accounting and reporting, Human resources, Insurance, retails, product and services
- Six Sigma classifiers
  - Lean sigma classifiers
- Simple samples
  - Bank, medical, retail, telecommunication and simulation scenarios
- Spreadsheets
  - Data templates for business items

© Copyright IBM Corporation 2009

Figure 9-15. Additional materials in your class image   WB286 / VB2861.0

Notes:

Additional materials located at C:\ drive in your class image

Unit summary

Having completed this unit, you should be able to:
• Explain the key concepts that were covered in this course

Figure 9-16. Unit summary   WB286 / VB2861.0

Notes:

Appendix B. List of abbreviations and acronyms

A

B

BPC Business Process Choreographer
BPEL Business Process Execution Language
BPM business process management
BPMN Business Process Modeling Notation

C

D

E

EAR enterprise archive
ECM Enterprise Content Management
ESB enterprise service bus

F

FDL FlowMark Definition Language

G

H

HTML Hypertext Markup Language
HTTP Hypertext Transfer Protocol

I

IDE integrated development environment
IDL Interface Definition Language
ISV independent software vendor
IT information technology

J

J2C J2EE Connector Architecture
J2C Java 2 Connector
J2EE Java 2 Enterprise Edition
J2SE Java 2 Standard Edition
JAR Java archive
JVM Java virtual machine

K

KPI key performance indicator

L

LAN local area network
LDAP Lightweight Directory Access Protocol

M

N

O

P

Q

R

S

SCA Service Component Architecture
SVG Scalable Vector Graphics

T

U

UML Universal Modelling Language

V

W

WAR Web archive
WSBPEL Web Services Business Process Execution Language
WSDL Web Services Description Language

X

XDE Extended Development Environment
XML Extensible Markup Language
XPDL XML Process Definition Language
XSD XML Schema Definition
XSL Extensible Stylesheet Language
XSLT Extensible Stylesheet Language Transformation

Y

Z